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VOLUME 63

NUMBER 12



DECEMBER, 1951

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# Nature in Print

By HOWARD ZAHNISER

"NO MAN," wrote Frank S. Smythe in a volume, *Behold the Mountains*, published about two years ago, "has really lived until he has looked into the heart of Nature, and learned to appreciate the magnificent world on which he has been created." This meditation from the heart of one of the superbly great mountain climbers of our time came at the close of a paragraph in an account of Mount Robson, which Mr. Smythe called "not only the highest but also the grandest mountain in Canada." It followed the comment: "I do not believe there are any better moments in life than those spent in the wild by a fire with the friendly trees towering around and the mountains outlined darkly against the stars. This is a life in which man returns close to Nature."

Such expressions and the experiences from which they arose, in the posthumous account of "The Mountains and Hills of North America" that made up only a section of *Behold the Mountains*, left one wishing that this climber who had written so expressively and understandingly of mountains in Europe and Asia might have been spared to give us a volume on his North American adventures and reflections. It is a major good fortune now to see this wish unexpectedly fulfilled in another posthumous volume, a great mountain book entitled *Climbs in the Canadian Rockies* — a great book likewise in its apprehensions of the value of wildness to modern man and the strength there is in confronting the stark physical realities that great mountains thrust before him.

*Climbs in the Canadian Rockies* is also one of those outstandingly excellent volumes that stimulate a reader to peruse again the choice works in its field of interest that have already become a part of his library. My friend and benefactor, Irving M. Clark of Bellevue, Washington, having long since pleased me with a prize Grubhorn Press copy of Conrad Gesner's Sixteenth Century essay *On the Admiration of Mountains*, it has been a particular pleasure to find my own Smythe-stimulated mountain-book browsing centering on this medieval physician's prescription of mountain climbing for health, and his justification of his counsel. It was a medicine that he took well himself. "I have determined for the future," he wrote with charm and candor, "so long as the life divinely granted to me shall continue, each year to ascend a few mountains, or at least one, when the vegetation is flourishing, partly for the sake of becoming acquainted with the latter, partly for the sake of suitable bodily exercise and the delight of the spirit."

Now, some four centuries later, it is reassurance indeed to find in this great modern mountain climber's counsels the same wisdom. Mr. Smythe too, as shown so vividly in both text and photographs of his earlier, Himalayan volume, *The Valley of Flowers*, was attracted by the "vegetation . . . flourishing" and by the physical and spiritual benefits of the exercise of his devotion to mountains. He delighted in the peaks of Canada's Rocky Mountain national parks, and "in the midst of a virgin land" in the Lloyd George Mountains of the far northern Canadian Rockies he rejoiced that "it was still possible to escape to a land unmeasured and unmapped." For in this almost uninhabited region, Mr. Smythe, a citizen of our highly mechanized, complicated, so man-modified, urban civilization, found added to his

intrinsic interest in mountains their efficacy in human restoration.

"It is silent, very silent, this country," he wrote. "It does not welcome the intruder, nor does it reject him; it is Nature, raw, untamed and untrodden. Between the walls of pines and the fragrance of their resin, in the breath of the cold green river, the traveller moves as though in a dream, a dream without beginning and without end. And that is the charm of the north-land. It is absolute, and because it is significant of naught but God and the works of God, it strips a man of all his complexities and pretensions, likening him in his manner of life and thought to its own peace and simplicity."

Such is the deep and tranquil ecstasy that Mr. Smythe knew in supreme moments. His effectiveness as a writer is such that a reader, too, can sense such an ecstasy. But one reaches it in Mr. Smythe's book only at moments and as the culmination of matter-of-fact narrative and description and by way, too, of the light-hearted although sometimes profound trivia of a reminiscent mountaineer. For *Climbs in the Canadian Rockies* is rich also in information and anecdote.

This Englishman's experiences with grizzly bears, for example (which he preferably would have had "eliminated from the national parks of Canada, and preserved in a safe and close confinement") are amazing and amusing — amusing to Mr. Smythe's discomfort, it seems. "It's a funny thing," he wrote, "a bear story, and it makes everyone laugh if you tell them you have been charged by a grizzly. It seems there are a lot of people who have never been charged by a grizzly. They ought to be taken by the scruff of their necks and dangled in front of a grizzly that has run out of salt and feels in a nasty temper." Whether this intrepid climber who depised so the use of pitons that would rob a mountain of its hazardous challenge, would actually have endorsed the removal of the grizzly from all the wilderness that Canada wishes to preserve, one can

doubt, but certainly his grounds for taking the grizzly seriously are well (though sometimes risibly) demonstrated in this volume.

The beaver, on the other hand, charmed Mr. Smythe and so aroused his interest in study that he has written us an entire chapter on this animal. Somewhat paradoxically, perhaps, for one who regarded most highly the unspoiled wild places, Mr. Smythe admired the beaver especially because "it is the only mammal that by making large-scale changes, adapts its environment to its needs." Another chapter, more closely related to mountaineering, deals with the topic "Lightning."

The rest of this book is personal testimony, narrative and descriptive, interspersed with reflection. Outstanding along with Mr. Smythe's regard for unspoiled Nature is his regard for the high spirit of man. To climb by artificial methods "in order merely to get to the top" he views as a "profanation" of the mountain and of mountaineering, but also "a sign of the degeneracy of man." One feels that it is with a tense fear that Mr. Smythe asks, if such artificiality should become a regular thing for all mountaineers, "Would it not mean that he had no longer a desire to risk himself, no longer a spirit of enterprise and initiative?" The use of pitons, he comments in another connection, turns mountaineering "into something merely expedient and introduces a factor inimical to that battle between man and mountain in which the charm lies in success gained by the qualities of both without the intrusion of artificial methods."

So great a book, so homely a narrative, yet one so charged with noble excitement and so respectful alike of Nature's wildness and man's high spirit, is indeed one to be both enjoyed and cherished.

## Snowfall by Night

By RUTH SEYMOUR VESELY

Go forth when strangely velvet ground  
Receives the steps without a sound,  
And search the dark until you see  
The glory of an ancient tree  
Renewed by phantom veils of white.  
Your burdened heart, on such a night  
Of slow, cool peace must surely now  
Weigh less than snowdrift on a bough,  
And Heaven seem a nearer place  
As unseen wings caress your face.

Walk alone by night to know  
The healing benison of snow.



It is a peculiar pleasure to have had the coincidence of Devereux Butcher's beautiful and effectively pictorial booklet on *Exploring the National Parks of Canada* for reading and reference along with Mr. Smythe's work. This complementary publication to Mr. Butcher's United States volume on *Exploring Our National Parks and Monuments* has already been reviewed by another in an earlier issue of this magazine, yet its enjoyment and its usefulness are so apposite in this connection as to warrant again calling it to attention. And its great value in contributing to the appreciation and preservation of some of the superb areas where Mr. Smythe enjoyed his wild tramps and his exhilarating ascents makes one wish to take advantage of every opportunity for helping to extend its influence.

What a cozy winter indulgence it can be to peruse these works, behold their photographs, and contemplate summers ahead that might possibly hold the privilege of testing one's spirit in these great still unspoiled natural areas of Canada!

*Climbs in the Canadian Rockies.* By Frank S. Smythe. New York: W. W. Norton & Co., Inc. Undated but published 1951. 260 pp. (6 by 9 in.), with 37 photographs (2 in color) on 34 plates, all but one by the author, 3 sketch maps, 4 diagrams of rock strata, 2 of beaver lodge, and index. \$4.50.

*Exploring the National Parks of Canada.* By Devereux Butcher. Washington, D.C.: National Parks Association. 1951. 84 pp. (6½ by 9½ in.), with statement on "The Parks and the People" by James Smart, director of the National Parks Service of Canada, 79 photographs, outline map, 4 decorative drawings, bibliography, and index. \$1.50 in paper covers.

#### American Mammals

*How to Know the American Mammals.* By Ivan T. Sanderson. Boston. 1951. Little, Brown and Co. 164 pages, with end pages of animal tracks. Illustrated by the author, and with 25 color plates by Fuertes. \$2.50.

This is a popular, pocket-size guide to a knowledge of American mammals. An introductory chapter discusses the mammals generally, then moves on to ancient mammal forms. Other chapters group the mammals as flesh-eaters, hoof-wearers, leapers, gnawers and those that find their home in the waters. A final chapter discusses newcomers among mammals.

#### Pony Story

*The Red Roan Pony.* By Joseph Wharton Lippincott. Philadelphia. 1951. J. B. Lippincott Company. 219 pages. Illustrated by C. W. Anderson. \$2.50.

This is a new, completely reset and re-illustrated edition of the delightful story of a pony, offspring of an Arabian pony escaped from a circus and a red roan colt of the Wyoming wilds.

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## Horse Album

*Album of Horses.* By Marguerite Henry. Chicago. 1951. Rand McNally and Company. 112 pages. Illustrated in color and black and white by Wesley Dennis. \$2.95.

This lovely book — a Junior Literary Guild selection — will delight anyone who loves horses. Hence the publishers indicate that the book is intended for ages from 10 up. We are well up from 10, and we have enjoyed the book immensely. The author has several other lovely horse books to her credit — outstandingly, *Misty of Chincoteague* — and writes about horses with both authority and deep affection. The illustrations by Wesley Dennis are notable.

## Briefly Noted

*The Zoo.* By Alberita R. Semrad. Chicago. 1951. Rand McNally and Company. 72 pages. Illustrated by Ralph Graham. \$2.00.

An attractive verbal and pictorial trip to the zoo for youngsters between five and ten.

*Kon-Tiki and I.* By Erik Hesselberg. Chicago. 1951. Rand McNally and Company. 80 pages. Illustrations by the author. \$2.50.

The author-artist was a member of the Kon-Tiki crew and here provides a graphic, amusing and condensed story of the great adventure.

*The Origin, Variation, Immunity and Breeding of Cultivated Plants.* By N. I. Vavilov. Translated from the Russian by K. Starr Chester. Waltham, Mass. 1951. The Chronica Botanica Co. 364 pages. \$7.50.

Selected writing of the famous Russian exponent of classical genetics, who was liquidated because he could not make his scientific integrity subservient to ideology.

*The Flaming Bear.* By Harold McCracken. Philadelphia. 1951. J. B. Lippincott Co. 222 pages. \$2.50.

A story based upon an Aleut Indian legend concerning the Alaska brown bear and written by a man intimately acquainted with these great bears.

*Summer is Fun.* By Lavinia R. Davis. New York. 1951. Doubleday and Company. 50 pages. Illustrated by Hildegard Woodward. \$2.50.

A Doubleday Junior Book of a fascinating summer and the things of Nature met then.

*Heavens on Earth.* By Mark Holloway. New York. 1951. Library Publishers. 240 pages. \$4.75.

This is a fascinating history of the various Utopian communities that were founded in America between 1680 and 1880.

*British Scientists.* By E. J. Holmyard. New York. 1951. The Philosophical Library. 90 pages. Illustrated. \$2.75. Brief biographies of outstanding men of science in Britain.

*Parasitic Animals.* By Geoffrey Laugel. New York. 1951. Cambridge University Press. 351 pages. Illustrated. \$4.00.

Discussion of the parasitic animals that affect man, either directly or through his domesticated animals.

*Sandy's Spurs.* By Lavinia R. Davis. New York. 1951. Doubleday and Company. 246 pages. Illustrated by Grace Paull. \$2.50.

An entertaining novel for youngsters who love the outdoors, particularly horses.

## Newfoundland Birds

*Birds of Newfoundland.* By Harold S. Peters and Thomas D. Burleigh. Boston. 1951. Houghton Mifflin Company. 431 pages. Illustrated in color and black and white by Roger Tory Peterson. \$6.00.

Although seemingly restricted geographically by its title, this fine book actually covers in the text and illustrations more than one-half of the bird species found in northeastern North America. It is, of course, the first complete and authoritative book on the birds of the area indicated in the title. The text provides all the usual ornithological data, and the illustrations by Roger Peterson are splendid. Both of the authors are associated with the United States Fish and Wildlife Service.

## Social Insects

*American Social Insects.* By Charles D. Michener and Mary H. Michener. New York. 1951. D. Van Nostrand Company. 267 pages. Illustrated with 30 color plates and 79 plates in gravure. \$6.00.

This book by two distinguished entomologists is a fascinating discussion of those insects that live in communities, including the bees and ants, wasps, hornets and termites. For some reason the lives of these insects appeal to more people than do the existences of the more solitary insects. Thus the Micheners' book, with its outstanding illustrations and popular yet authentic text, will have a wide appeal, both for reading and for reference.

## The Animal World

*This Fascinating Animal World.* By Alan Devoe. New York. 1951. McGraw-Hill Book Company. 303 pages. \$3.75.

Alan Devoe started wondering about Nature when a boy, and as he grew older his curiosity grew also. Formal study was supplemented by observation in the field, both on his hundred-acre New York State farm and elsewhere. In the course of his own wondering about Nature he found that many other people also wondered, but, more often, were content to leave the questions unanswered. In this book he answers a thousand and one questions about the fascinating animal world about us. This is the sort of book that one can pick up for a few moments for a bit of Nature browsing, or one can turn to the index to find the answers to many Nature questions. The text, of course, is written in Alan Devoe's charming style, making the information acquired even more pleasurable.

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# By Way of Report

**T**HE Sixth Annual meeting of the Natural Resources Council of America was held at Franklin, North Carolina, on October 1st and 2nd, 1951. The Council is comprised of the leading national conservation organizations, scientific societies in the natural science field, and a few specialized regional organizations whose major objective and activity is conservation. Eighteen national organizations were represented by the executive head or an accredited delegate.

The main purpose of the meeting was to discuss and formulate a policy for the scientific use and development of renewable resources. It has long been recognized that to provide the means for a high standard of living in a healthful environment some fundamental policy satisfactory to all conservation organizations should be adopted for the use of the basic resources of soil, water, plants and animals, in order to maintain them through the years and prevent their waste and depletion.

Proper education in this field by the American Nature Association, among other conservation organizations, has brought about a growing understanding that soil, water, the living resources, and man are intimately related; that natural resources constitute the basic strength and wealth of this nation. These resources can be needlessly exploited under a narrow concept, or they can be managed wisely and utilized for the continued strength and vitality of the national economy under a broader policy, as advocated by the Council.

Natural watersheds and river basins have become widely accepted as the most desirable and practical units for planning resource developments. Too often, however, development proposals emphasize power, irrigation and flood control opportunities to the exclusion of other values. These are not the only uses of water; in fact, they may not be the primary or most fruitful ones. Land, water, forest and wildlife management; the preservation of wilderness; development of recreational opportunities in parks, forests, and national monuments, and the protection of fishing in both inland and coastal waters warrant equal attention. Experience shows, and science has proved, that natural resources are interdependent, either thriving together or wasting together according to the manner in which treated.

The meeting of the Council was held at Franklin, North Carolina, to enable representatives of the conservation organizations to visit The Coweeta Hydrologic Laboratory, in the Nantahala National Forest. Here the Forest Service, through fundamental hydrologic research, is developing practical methods of forest and land management for maximum timber, forage, and water production consistent with region-wide interest in flood control and industrial, municipal, and recreational use of water!

Lowering water tables, and reports of water shortages from various part of the nation, indicate that water is a major, critical national resource. Conservationists are agreed that water is probably the paramount product of forests because of growing needs of industry and municipalities for water; that there is need of more work in preserving and restoring plant life in headwater areas to prevent erosion. In many places unwise clearing, pasturing and tillage practices have caused serious loss of the richer top soils by water erosion. Erosion, stream pollution and water waste take the very life out of the soil, and man is rooted to the soil.

Our population has doubled within the past 50 years and our per capita consumption of water has also greatly increased. Ground-water scientists assure us, however, that there is still a lot to spare, except in parts of the West where there has always been a natural deficiency of water.

The aim of the policy of the Natural Resources Council is to achieve unified scientific management and perpetuation of land, water, and the living resources in the widest public interest. —H.E.R.

**T**O HELP increase the emphasis on conservation teaching in biology programs, the National Association of Biology Teachers has initiated a three-year project with the assistance of a grant-in-aid from the American Nature Association.

Descriptions of outstanding programs under way now are being solicited by state chairmen and committees. The committees are particularly interested in how various teaching techniques have been used to increase interest in conservation, such as field trips, films, camps, school forests, nature trails, use of community resources and agencies, group work, school-ground projects, fairs, exhibits, and the like.

Local, state, regional and national workshops are planned to permit biology teachers and others to develop adequate criteria for good teaching, to share experiences, organize descriptive material submitted by teachers and to assist in developing projects and programs in schools interested in initiating a stronger conservation program.

A national committee consisting of the state and regional chairmen, and an executive committee of seven, will guide the project and be assisted by an Advisory Committee of representatives of twenty-five national conservation groups.

Anyone willing to assist in the project in any way, or knowing of biology teachers who are doing an outstanding job in this field, are requested to write to Dr. Richard L. Weaver, Project Leader, P.O. Box 5424, State College Station, Raleigh, N. C.

The first regional workshop is planned for Philadelphia, December 28, and will be held in the Hotel Adelphia as a part of the annual meeting of the National Association of Biology Teachers.



# Contents Noted

ANNUALLY it has been our effort, on this page, to say something at the Christmas season that might add its little bit to the furtherance of peace on earth and good will toward all men. This year the task is difficult, for just a few days ago we lost the person most dear to us, the companion of almost twenty-seven completely happy years. We would not parade our grief here, deep though it is within us, had we not through the years made so many friends through this page; did we not feel that we could draw from her life something beautiful at this season; were we not under a strong compulsion to pay her tribute here.

SHE was the most utterly unselfish person we have ever known. Although tiny, her love seemed as inexhaustible as the ocean. Whether it was the laundryman or the admiral who lived around the corner; the milkman or the retired general in the next block; the grocer or people that she met at the bus stop, they all loved her for her smile, her friendliness and her concern for their problems. After her passing came a note of sympathy from one who had lain in the bed next to her in the hospital during the first three weeks before we knew what terrible thing was tearing at the fraying ends of her life. This hospital acquaintance wrote: "I came to love your wife during the four days we were side by side in the hospital." That is the way she was — four days, four hours, four minutes were enough to love her. From Belgium, where we were together for an international meeting in October, 1950, came, in French, "in the seven short days she was with us she found her way into all of our hearts."

ENGLISH was her only tongue but language was no barrier. We can see her now in the Paris Metro admiring a puppy being carried in a little bag, and can see also the pleasure of its owner, who understood not a word that was being said. And, coming back from Montparnasse, a tired young couple with a sweet baby smiled and seemed rested through the admiration for their offspring she expressed to them in a strange tongue but understandable in the universality of love.

NOT being a deeply religious man, with the comforting faith that such deprivation is for a reason, we at first asked "Why?" We could not understand why one so outgoing, who brought so much happiness to so many, should go, while others who spread malice and hate go on and on. We do not yet understand, but we have ceased questioning, for we know that she has achieved an immortality in the hearts of those who loved her, who came to pay tribute to her or to send words of sympathy and affection from afar. She is

always there in the home we shared together; in the strength and kindliness and love of life and people that she passed on to our daughter.

AFTER the first rebellious hours we have come to see how richly blessed we were; to know that too few men have known such complete happiness. We had never truly known grief before, for this was the first loss of anyone close to us, and we think that to know the choking upwelling of overpowering sorrow is to gain a certain strength. We had never known that a man could have such a capacity for tears, and we are thankful for the relief that is in them. We are thankful for the memory of beautiful places seen together, for the happiness we shared in travel, the theater, the outdoors, the birds, the flowers and in friends. And we are humble in now fully realizing, as we think we did not before, the wonder that lies in true friendship. We had always been hesitant to go to a home where grief was fresh lest we be intruding. We will never feel that way again, for those handclaps and those few companion tears are precious.

SURELY at this Christmas season, from such as she, we may draw hope for peace and love for all mankind. She loved Christmas — and we dare not think what it will be without her — but she loved the giving more than the receiving. She loved the thoughtfulness of the Christmas season; the good will it expressed; the carols.

SOMEONE wonderful has gone out of this life. It seems much too soon at fifty-four, but perhaps she could give of herself only just so long and so much. Perhaps she had a greater task to perform somewhere. Perhaps by her passing she left for us who still remain an example that will make our part of the world a better place in which to live. We do not know. But one of our readers and an occasional contributor to our pages — a contributor whom we know only through long correspondence — reached into her scrapbook of favorite poems and copied for us a poem by Violet Allyn Story entitled "Prayer in Affliction." It seems to us that it is a beautiful poem at this season, and we know that we find comfort and strength and wisdom in it. The poet wrote:

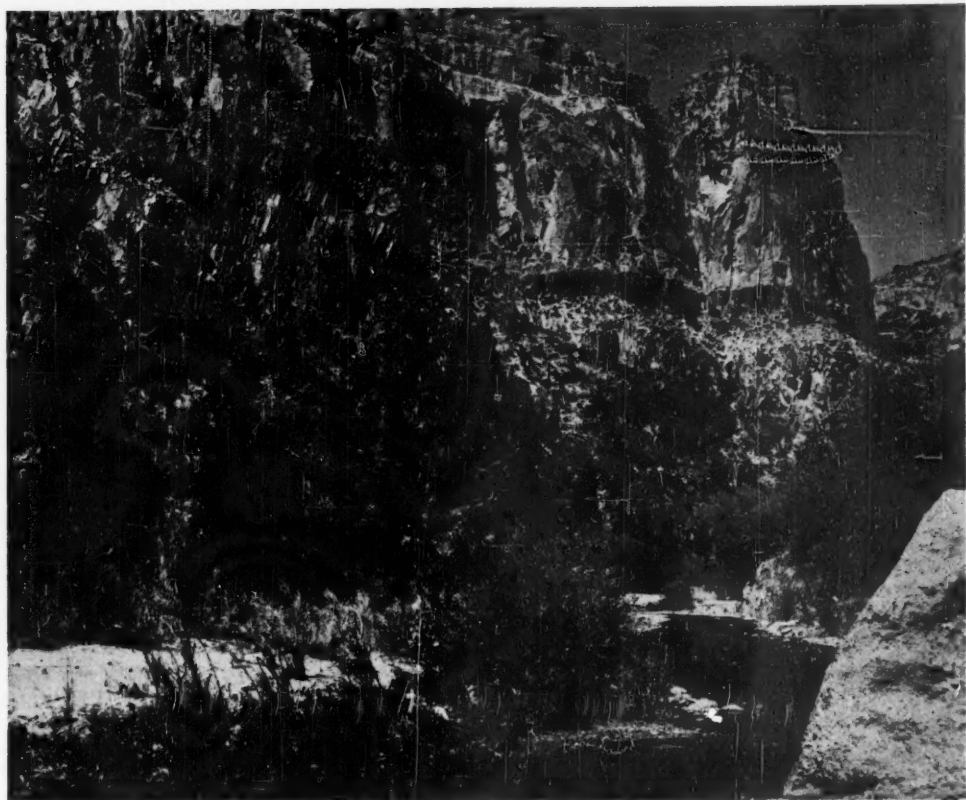
Keep me from bitterness. It is so easy  
To nurse sharp, bitter thoughts each dull dark hour!  
Against self-pity, Man of Sorrows, defend me  
With Thy deep sweetness and Thy gentle power!

And out of all this hurt and pain and heartbreak  
Help me to harvest a new sympathy  
For suffering humankind, a wiser pity  
For those who lift a heavier cross with Thee.

—R.W.W.



The only trail up the canyon is the stream bed itself, and the sparkling creek, twenty to thirty feet wide, swings from side to side under steep banks and impassable cliffs.



Near where Virgus Canyon enters the Aravaipa the walls become higher and the gorge narrower.

## Aravaipa Canyon

By WELDON F. HEALD

*Photographs by the Author*

**H**IDDEN away amidst the vast expanses of the far West there still remain little-known, unspoiled places that rival in beauty and grandeur our most celebrated scenic wonderlands. Once in awhile it has been my good fortune to run across one of these retiring masterpieces of Nature, but of them all, I believe, the greatest surprise was Aravaipa Canyon.

For several years I had heard vague reports about this unique gorge, which cuts completely through the barren and rugged Galiuro Mountains of southeastern Arizona. But I never could find anyone who had been in its upper part, and I had seen but one picture taken there. This was enough to stimulate the explorer's urge, but it did not prepare me for the startling

revelation that Aravaipa Canyon is scenically, geologically, botanically and zoologically one of the most remarkable places in the entire West.

However, you do not just pack a picnic lunch, start the family car, and shout, "Aravaipa, here we come!" This secluded retreat is tucked away among jumbled desert mountains in some of the wildest and most remote country in southern Arizona. The delights of Aravaipa are won only after a strenuous and determined courtship.

There are two ways to reach the canyon. A dirt side road, branching from State Route 77 at Feldman, 58 miles north of Tucson, penetrates its lower western end; and the upper section can be entered afoot or horseback from Klondyke, in Sulphur Spring Valley



Often Aravaipa Creek flows through boxlike gorges with sheer cliffs rising from the water's edge.

ribbon-like along the stream for eight miles. Once the home of the war-like Aravaipa Apaches, white pioneers found the soil, water and climate of this sheltered Eden to their liking in the early 1880's, and today the road passes a half-dozen ranches on both sides of the creek.

It would be difficult to imagine a more peaceful refuge, well-insulated from the tenseness, insecurity and fear complexes of our modern atomic civilization. Each ranch house seems calm and tranquil, resting in the shade of spreading trees, and surrounded by cultivated fields, orchards, citrus groves, and flower gardens. And everywhere within these steep, protecting walls you can hear the musical sound of Aravaipa Creek unhurriedly flowing over its pebbly bed.

The road climbs, twists and dips up the narrowing canyon, then abruptly ends at the gate of the last ranch. Signs reading, "No Trespassing" and "Beware of the Dogs" have a

tendency to discourage further exploration. The fact that private property blocks the west entrance to the upper gorge is one of the reasons why it is so little known and seldom visited. Up to now, this artificial barrier fortunately has acted as a safeguard in keeping Aravaipa Canyon in its primitive, natural condition. On the other hand it has denied many true Nature enthusiasts the opportunity to enjoy one of the most outstanding and spectacular areas in the entire Southwest.

Perhaps the happiest solution to the present anomalous situation would be to build an access trail around the north side of the ranch, and for the Federal Government to establish a primeval ecological reserve to keep intact this superb and unique remnant of our fast-vanishing wilderness. Complete protection to all plant and animal life within its borders should be given, for the narrow canyon floor is too limited and Nature's adjustments are too delicate to survive an influx of visitors should the area be exploited as a county park, state reservation, or even a national monument. Such a reserve might easily be created, as the upper canyon

to the east. My first trip was made from the lower end, so I am an enthusiastic advocate of the Feldman route.

It was a sparkling March morning when a companion and I turned the jeep into the dirt road and headed toward a great gash in the Galiuro Mountains that the map showed was Aravaipa Canyon. A rain the night before had washed the desert air crystal clear, and the broad San Pedro River valley stretched southward under an indigo sky to the shining snows of the Santa Catalina Mountains. For six miles we wound among stony hills, dotted with the fluted, green columns of giant saguaro cactus and clumps of spiky yucca, to the canyon's mouth, which suddenly opened and swallowed us.

Immediately we were in a lush, verdant world confined between high, rocky walls. Huge trees arched over the roadway, banks of shrubbery, tall grass and wild flowers pressed close on either side, and the waters of Aravaipa Creek glinted in the sunlight through the foliage. This delightful oasis of the lower canyon winds

tendency to discourage further exploration. The fact that private property blocks the west entrance to the upper gorge is one of the reasons why it is so little known and seldom visited. Up to now, this artificial barrier fortunately has acted as a safeguard in keeping Aravaipa Canyon in its primitive, natural condition. On the other hand it has denied many true Nature enthusiasts the opportunity to enjoy one of the most outstanding and spectacular areas in the entire Southwest.

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is a part of the public domain and owned by us all.

In our case, we braved the dogs, received gracious permission at the ranch house to pass, then followed a rough track for a mile or so through orchards and fields. It petered out in a luxuriant, tree-bordered meadow, and even the jeep could go no further. Ahead sheer cliffs guarded the entrance to the upper gorge. Here we shouldered our packs and entered the mysterious portals.

This section is the climax of Aravaipa Canyon. For more than ten miles the stream has carved a winding trench through the heart of the Galiuro Mountains. On either side the enclosing walls rise in precipitous, naked cliffs of buff, pink and red sandstone, six to seven hundred feet high. Giant cottonwoods and feathery willows lean over the rippling waters and shade grassy banks spread with wild flowers, while, in sharp contrast, saguaro, barrel and cholla cactus, and sparse desert shrubs climb the broken slopes to the base of the cliffs. It is worth every effort to enjoy such beauty.

Such a cool, clear, mountain creek buried deep in an arid gorge is unique in southern Arizona, and in the entire region it is the only sizable stream that flows fresh and strong, summer and winter, year after year. Varying from twenty to thirty feet wide, it swings from side to side in its narrow bed, and we soon found that the only way through the canyon was by crossing and recrossing the creek, sloshing in water often up to our knees. Exasperating at first, our amphibian progress became pleasant and refreshing as the sun beat down upon us.

This unorthodox stream rises in the northern part of wide, grassy Sulphur Spring Valley, where it flows, mostly by underground seepage, in a northwesterly direction for twenty-five miles. Then it suddenly veers southwest, bursts forth on the surface and escapes from the valley by burrowing through the mountains to the lower San Pedro River, which it joins ten miles below the junction with the Gila.

Great pinnacles and promontories rise above the canyon at every turn.

Some of the foibles and eccentricities of the Aravaipa are undoubtedly due to its advanced age. Far older than the mountains that now imprison it, the stream has probably followed the same course since the Tertiary Period, at least ten million years ago. As the great north-south fault block slowly rose across its path to form the Galiuro Mountains, the creek busily excavated the rock and managed to maintain an even grade, until today it is entrenched 2000 feet to 3000 feet below the crest.

Mile after mile we pushed on deeper into the gorge, and the enchantment of Aravaipa grew upon us. We threaded box-like canyons walled by perpendicular rock rising from the water's edge. We passed through wider stretches holding green oases backed by soaring cliffs curving ahead into the unknown. Each turn revealed towering palisades of brilliant-hued sandstone and boldly jutting promontories high against the sky. In places we followed the creek through leafy tunnels formed by arching trees lacing their branches together



overhead, and even in the most rugged and barren parts of the gorge we found cottonwoods and willows growing along the banks wherever there is foothold.

Here and there we looked up steep side-canyons where hillside springs water green tangles of oak, sycamore, ash, walnut, shrubs and ferns. And yet, a few feet distant, there were dry slopes carrying a typical desert growth of cactuses, yuccas, mesquites, creosote bushes and an occasional solitary juniper clinging to the cliff-tops. The saguaros of Aravaipa are particularly magnificent and striking, and grow to heights of thirty to forty feet. Two such diverse biotic provinces in immediate association within a limited space make for a rich and complicated flora and fauna, and as yet Nature's hair-trigger balance is completely undisturbed. There should be here some rare specimens and unusual ecological communities, and I hope that some aspiring naturalist with a thesis to write will make Aravaipa Canyon his special field before it is too late.

So far as I know, no one has studied the area in detail. Among the birds casually reported are, of course, that happy winged genius of the Southwest, the canyon wren, whose liquid, cascading notes we often heard among the cliffs, the Arizona crested flycatcher, Cooper tanager, Arizona hooded oriole, vermilion flycatcher, white-winged and mourning doves, gila woodpecker, gilded flicker, phainopepla, yellow-breasted chat, bridled titmouse, western kingbird, turkey buzzard, desert quail, black phoebe, Abert towhee, Mexican black hawk, verdin, white-throated swift, Bewick wren, Anthony green heron, Arizona cardinal, and Arizona pyrrhuloxia. These were all reported by John L. Blackford in his article, "Aravaipa Canyon: A Living Laboratory," *The Living Wilderness*, 1950.

We know even less about the mammals, reptiles and

insects of Aravaipa Canyon. Although I have never run across a rattlesnake there, he is one citizen to watch for with a wary eye. Probably, too, the orange and black banded lizard, the gila monster, lives on the desert slopes. But he is harmless unless you insist that he give you a slightly poisonous nip. Bobcats, coyotes, mountain lions, mule deer, raccoons, skunks and ring-tailed cats have been killed in the lower canyon, but it is unlikely that coatis, ocelots and jaguars, as well as parrots and the rare coppery-tailed trogon, stray so far north of the Mexican border. However, the collared peccary, a tough, fearless little pig-like animal, reaches the northern limit of its range in the vicinity.

We stopped in the vast rocky amphitheater where Virgus Canyon joins the Aravaipa from the southeast. Here we lunched and explored a little way up the tributary gorge. But our time was limited and we finally turned with reluctance and splashed out way back toward civilization. We knew that what we had seen was merely a quick preview of one of Nature's grandest spectacles.

But the lure of the Aravaipa is strong. It has drawn me back again and again. I have seen the canyon patterned with silver and black in the full moonlight. I have watched the high, white cumuli of summer boil up into the sky and the gorge flash with lightning and reverberate with thunder. I have seen the trees in the flaming reds, yellows and orange of autumn, and the rims whitened with winter snow. But at all seasons Aravaipa Canyon seems beyond all else to be Nature's stronghold where life has gone on undisturbed since the beginning of time. Here one feels the pulse of the world, and begins to understand some things that were vague before. Long may Aravaipa Canyon be spared the neuroses, progress, and bulldozers of men.

## Sea or Mountain?

By CARRIE WARD LYON

To each his fastness or his liberty!  
To you your mountain and to me my sea!

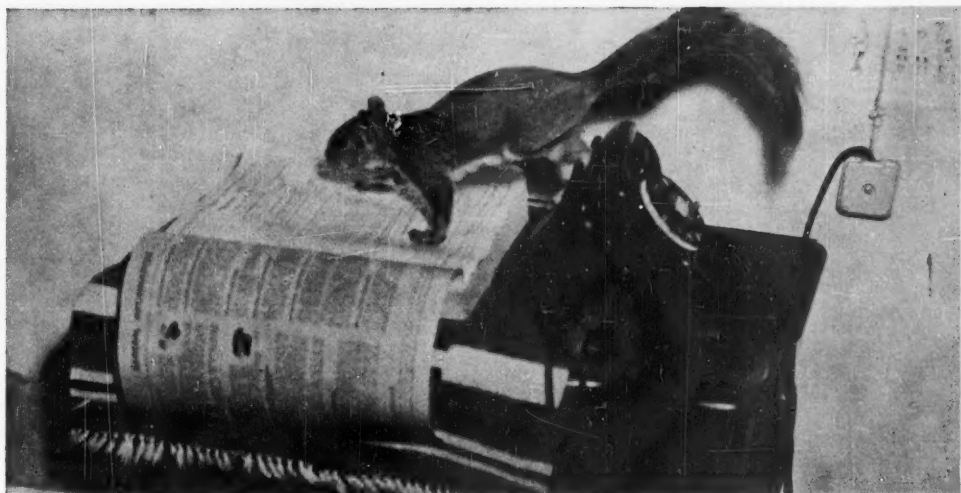
But the eternal beauty is the same,  
However given, by whatever name.

Your purple hills are my waves caught at crest,  
My billows stilled, your plain of azure rest.

The twilight tinkle of your distant sheep  
And mountain brook that babbles in its sleep

Recall old music other than we hear,  
More true than time and infinitely dear,

That ever waits in joy to set us free.  
To you your mountain and to me my sea!



Dinky studies the telephone directory to see whether she can find any interesting telephone numbers before putting in a call.

## A Squirrel in the Home

By ARTHUR H. CARHART

*Photographs by the Author*

**H**AVE you ever had a squirrel in the house? Not a pet in a cage but a free personality who assumed a position of equality, insisted on rights and privileges as definitely as a human, and at times positively, and sometimes angrily, asserted demands and determinations as definitely as any opinionated person. We had such an experience while Dinky lived with us.

Our first glimpse of Dinky was a crawling something under a big golden willow tree on our parking. Vee was looking out the window and saw the little mite crawling in the dead grass. The day was bleak; late October.

"Go out and see what that is, Art," Vee directed.

I picked up the little fellow; a tiny fox squirrel, eyes not yet open. When I placed her on the tree trunk, she climbed a few inches, stopped to shiver, then inched up a half-foot to stop again. She would drag her little body up over the rough bark and stop to muster strength for the next effort. That desperate, dogged, and certainly futile struggle to lift herself back up to the old nest twenty feet above, won us.

"Bring it in, Art," Vee called from the window. "It never will get up to that nest; it'll die."

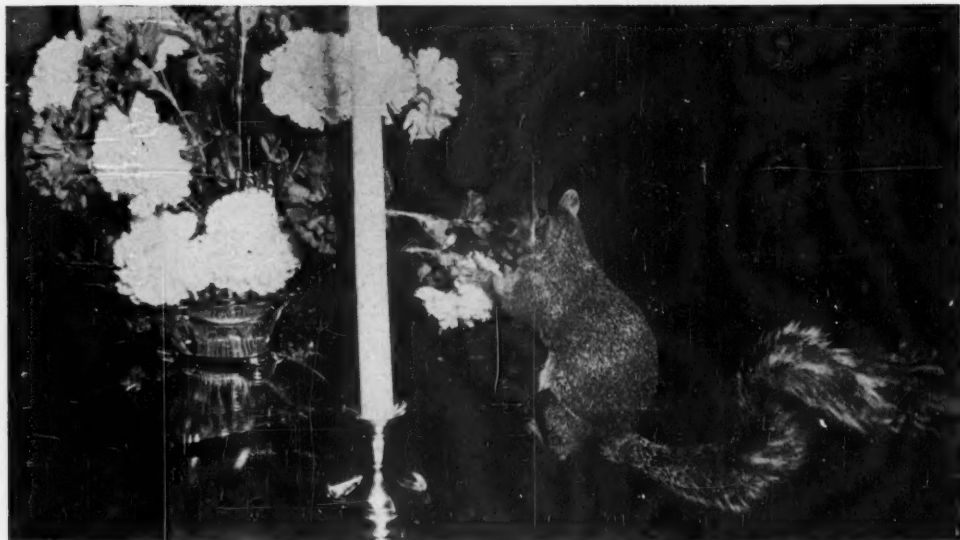
Dinky's first feeding was by a medicine dropper. For three days it was nip and tuck whether she would live. I had to hold the wobbly little squirrel and often she choked as the milk fed out of the dropper into her

tiny throat. Within a week she was clawing the dropper, sputtering as she tried to gulp milk too fast, while milk bubbles bulged out her nostrils. Soon she was grunting protest when the milk was gone out of the dropper.

While her eyes still were closed, she began climbing out of the old blanket nest in a cardboard box we had placed in the kitchen, and wobbling around over the linoleum. We had to watch every step we took when in the room. One night Dinky got out of the nest, scrambled blindly to the head of the basement stairs, and, when I found her, she was all the way down, bumping around near the motor of the electric refrigerator. That adventuring was a forecast of what ultimately was to happen. She had an urge to go places. After that we had to close all doors to the kitchen when we put her to bed.

First one of the eyes, then the other opened. That spread a new world before Dinky. To curb her travels we got an old canary cage. That led to some "training" that may be unique in the record of pet squirrels.

Dinky was inclined to be very meticulous about herself. She would wash her face, comb her head, run forepaws over her body, and end by a thorough brushing of her scraggly tail. Perhaps it was this trait that aided in having a squirrel that was "house broken." A paper towel was spread in the bird cage. I would pop Dinky inside before breakfast and other meals.



The question arises as to whether it would be better to sniff the carnations or to take a nip out of them to discover just what they taste like.

She would grunt and chatter a while, do her duty on the paper towel, then come chuckling and "talking" to the door of the cage to be let out.

We switched from the medicine dropper to a small, doll nursing bottle to feed Dinky and she would sit up on the drain board of the sink, holding the bottle, nursing like a baby. The first solid food was a sweet grape. She gobbled grapes, discarding seeds in any direction. We tried other foods; a bit of carrot, a scrap of celery, and finally nuts. When the nuts became the primary food, she quit the milk, and would drink water noisily out of a small dish.

At breakfast, Dinky's meal would be spread on a newspaper covering the drain board. Sometimes she would jump to my shoulder, then to the curtains beside the breakfast nook. Up on the curtain rod she would proceed to gobble up a nut she had taken with her, throwing the shells down on the table. Then she would stretch out, hanging down by her rear paws from the curtain top, yawn in our faces, and then nap on the curtain top. Or she would start racing, swinging, dodging back and around the curtains, showing off like a kid on a home-made trapeze.

Earlier weeks the little squirrel slept many hours of the day as well as the night. Later she would nap a little while, and then start running through the house. The basement was a place to poke into every corner, take a nip at anything encountered, and explore every niche.

One of the most attractive places was the basket under the clothes chute. We would give Dinky a nut and, if she was not hungry, she would gallop down the stairs, leap up to the clothes basket, and tuck the nut

under cover. Just as an incidental piece of business, she gnawed holes through one side of the wicker basket.

As her teeth grew to usable strength, she gnawed anything and everything, including my fingers. When she was hungry, she would make a flying leap to my pant leg, run up to my shoulder, stick her nose in my ear, do a little "talking" then run down to nip my fingers, very gently. That meant, "When do we eat?"

The gnawing included the top of the window frame. It was while Vee was breaking up this destruction of the woodwork that we heard the full voice of the little squirrel. Before, all her "conversation" had been chuckles and grunts.

"Here, you," Vee said, and grabbed Dinky, yanking the little animal away from her wood-chiseling. "I'll whip you!"

Vee held her in one hand and gave her a sharp little spanking. Dinky twisted, looked at Vee with as petulant an expression as one ever saw, and let out a string of full-voiced yelling as loud as ever a bad child produced. For some reason, Dinky would not accept such handling from Vee as she would from me. I could slap her for bad behavior, and she would only look, steadily, accusingly. But whenever Vee tried to govern Dinky, there was a yelling, "don't-you-dare-strike-me, you — you—human!" sort of ruckus.

One place Dinky could chew without our stopping the fun was the wood in a basket by the fireplace. She would flip and crawl around the wood, gouging chunks here, other chunks there. She found out this wood was open to attack, and would make for it in the evening to get gnawing practice.

The evening was the big time of the day. Dinky



**This is not a prayerful attitude on Dinky's part. She is holding a nut wondering where she will hide it.**

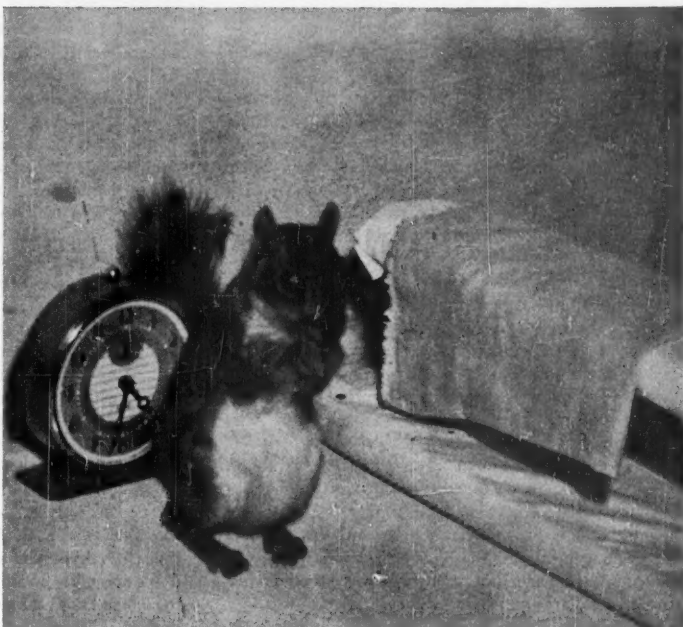
would eat dinner beside us, maybe hop to the table to sniff human food, play with the silver. Or would find refuge on the top of the curtains, lie there, watching as the dishes were done.

Then I would hold out my arm, she would run down the curtain, skip to my shoulder, and ride to the living room. Or there might be a little game in the kitchen before we settled, or tried to do so, in the living room.

Dinky had no other squirrel to play with. We were the only "squirrels" she knew. And she would play like a kitten.

She would run down to the floor while we were finishing a meal and frisk. There were somersaults, flips, and a very spectacular jump in which she would leap directly up, turn end for end in the air, and come down facing in the opposite direction.

The kitchen game, a very definite pattern, was a great bit of show-off. I would put Dinky on the drain board, back away, she would squat there all humped up, bunch, and leap to catch on my shirt front. It was re-



peat and repeat, with cheers from the audience and clear evidence by Dinky that she was enjoying being so important and spectacular. The jump would be from five to seven times her length but if it was too far, she would run to the table in the breakfast nook, get down on the floor, and make the jump from there. Night after night we practiced the jumping feat.

In the living room, there was more play. The whole run of the room was open, and Dinky would shoot across the floor, leap to a chair, whirl around the back, hit the floor in a somersault, flip into the air, leap to a chair, circle it, and go tearing in another direction, round and round, tirelessly. When I sat on the floor, and often when I was in a chair, I was one of the "big tree trunks" in this racing play pattern.

Dinky would sit up on the top of an upholstered chair and box. I would poke at her with my fingers, and she would slap and wrestle. Very occasional-

Dinky was discouraged from gnawing on the woodwork, but the wood basket was fair game for gnawing and with no interference.



ly she would nip too sharply in the excitement of the bout, and I would cuff her. She would sit, staring a moment, then take up the game again and nip more gently.

Another game, a definite pattern of fun, repeated time and again, was hide-and-seek. Dinky would ride to the living room on my shoulder, scamper down, race away into the darkened bathroom, hall or dining room and hide. I would come from the living room, hunting. In the semi-darkness the little squirrel would peek out from behind a door or from under a table, and when I got close, would leap out, as much as to say, "Here I am; right here."

Then Dinky would ride back to the living room, scamper to the floor, gallop into the darkened rooms, and I would hunt. If I did not come right away, Dinky would come back to the middle of the floor in the lighted room, look up, pivot and go galloping to hide.

Our plan always had been that when the squirrel was large enough to release she would have her freedom. As a transition stage a large cage with a little house in it, was placed on the outside terrace. Dinky was brought in only for breakfast on the sink drain board, the evening meal and the play period afterward. She played in the cage, but it always was stopping her from going places and seeing things.

Other squirrels came by and "visited," sharing a bit of lunch on the nuts we placed there, outside the cage. As February warmed, Dinky was allowed outside the cage for short periods. She explored the elm tree in the garden and the old squirrel nests there. Once she got entirely outside of the yard, disappeared, and finally was located on a garage roof some distance away. When I found her, she came racing, "talking" excitedly while she rode my shoulder back to the cage.

We left for a few days on a trip and a neighbor fed Dinky. She got out on several days before we returned, but came back to be fed and slept in the little house in the cage. A few hours before we returned, she

gnawed her way free. We hunted, offered nuts to squirrels in the neighborhood, found no Dinky. She had been restless, maybe lonesome, while we were away. Perhaps we never will know whether Dinky has come back or not. We believe she has.

One morning several weeks after her leaving, a squirrel was rummaging under the thornapple tree in the garden. I went out and started to talk as I had to Dinky. The little squirrel did not come to me, but at the sound of my voice our visitor began to caper and do all the tumbling, jumping and flip-flop tricks Dinky had done in our living room. Other mornings the same thing has happened.

The squirrel we believe may be Dinky comes to the cage, enters to get nuts we leave there, goes into the little house, and shows no extreme uneasiness about being inside the cage with its open door as do other squirrels that have entered. If this is Dinky, she has come to take nuts out of our hands. She shows up regularly after breakfast, and will circle and bounce around, coming close to us, but never jumping and running to our shoulders as Dinky once did without any hesitation. In contrast, the little male squirrel that is Dinky's companion keeps his distance.

We speculate on what may have happened so greatly to change Dinky's attitude toward humans — if this is Dinky. Perhaps this squirrel, so totally unafraid of humans, may have tried to be friendly in those first hours out of the cage and was cuffed for such familiarity. Or it merely is the surge of wild wariness that full freedom brought. We will never know for sure if our pet has returned. If you have ever tried to identify an individual squirrel among all those you may see, you realize it is not easily accomplished.

If you have a chance to have a squirrel living as a member of the family, as we did, you will find they are very definitely interesting "people." It is a marvel, the personality that can function through a brain no larger than a buck-shot.

## A Child's Christmas Tree

By ULRICH TROUBETZKOY

In each glass ball your wonder's visible —  
Gestures in blue and green, laughter in gold;  
The mimicry of silver, purple, red,  
Tingles with your light dancing, five-year-old.  
The wooden creatures of the manger live  
When you lean down with love to fondle them  
And the Star's real since you have coupled it  
In your mind's sky with that of Bethlehem.  
Tinsel to you is not mere artifice,  
Nor colored bulbs a mock of candlelight,  
And both your eyes are happy mirrors of  
A Tree turned jewel, hallowing this night.

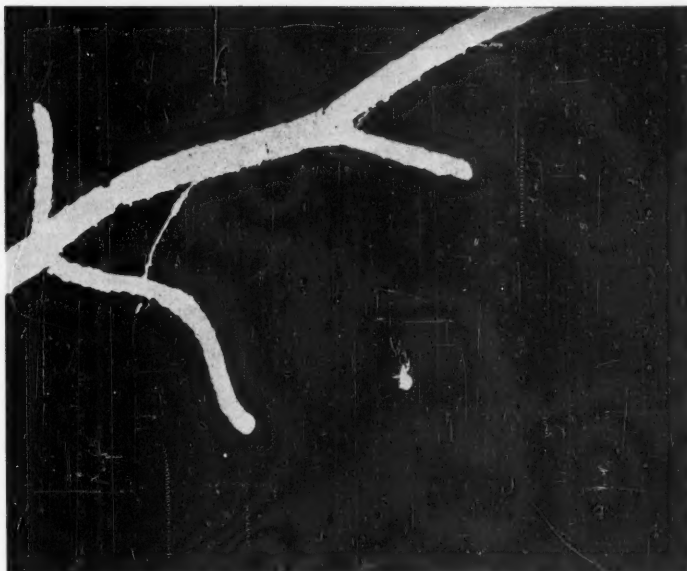
Hanging from the third ray and spinning the sticky line which will be carried across and down to the fourth ray.

# Triangle Spider

By WALKER  
VAN RIPER

Denver Museum of Natural History  
Photographs by the Author

**T**HE unique triangular snares spun by spiders of the genus *Hyptiotes* are not rare, but, because they are inconspicuous and relatively small, they are not often noticed except by the naturalist especially looking for them. Only two species are known for North America, *H. cavatus* in the East and *H. gertschi*, found in the western and northern parts of the United States and in Canada. The web of the latter, its use, and the steps in its construction concern us here. This species is named for the author of *American Spiders*, Dr. W. J. Gertsch of the American Museum of Natural

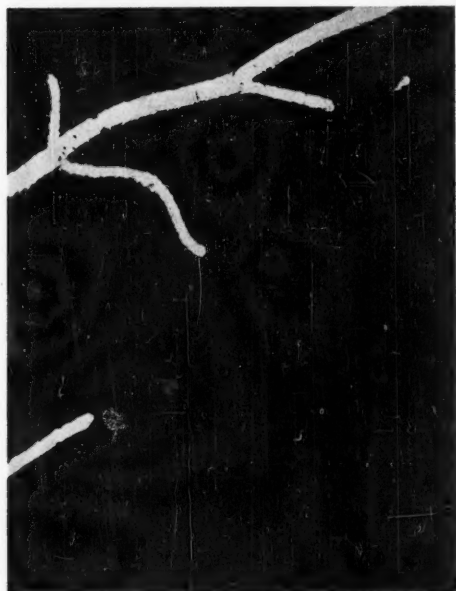


History, outstanding authority on the spider group.

This spider is most often found in pine woods, and the snare is generally strung on a dead branch, low down, not more than four or five feet from the ground. The spider is small, about one-sixth of an inch over all, and mottled gray in color. Thus it is hard to see her against a background of pine bark.

The web varies in size, but is generally contained in a space eight or ten inches square. It consists of four rays, diverging from an apex and crossed by ten to twenty zig-zag transverse lines. From the apex a line stretches to a supporting twig. A short distance out from the twig the spider hangs on the line, back down. Examination with a magnifying glass shows that she is keeping the web stretched taut, her fore-legs grasping the line toward the apex and her hind legs holding that part connecting with the twig. Over her belly are some coils of slack. Study also shows that the cross lines are different from the rays. The latter are single, non-sticky framework lines, while the cross lines are extremely sticky, thick, compound threads.

When an insect flies into the taut snare, contact with the sticky lines seems to stop it. Immediately the spider lets go the loose line she has been holding, thus relaxing the taut snare. Then she pulls the web taut, then lets it go slack again, repeating this several times. In addition, she vibrates the web from side to side, as do many orb-weavers. All this serves to entangle the prey more firmly. The spider then runs down the slack web to the prey. She does not bite it. In fact a



The complete web with the spider in her characteristic position.

The web in use. A fly has been thrown into the web. The spider first lets the web go slack, which further entangles the prey. Then she rushes down the web to the prey and proceeds to wrap it up.

bite would be of little help, as this is one of the few spiders with no venom glands of any kind. What she does is to wrap the prey into a ball, turning it over and over and manipulating the spray of silk from the spinnerets with the fourth legs. She then proceeds to suck the insect dry, a deliberate process that may take hours.

In capturing a single insect, the snare is destroyed. The following night a new one, generally not in exactly the same place as the old and not exactly like it in size, is constructed. The process, particularly the placing and manufacture of the sticky cross lines, is an interesting one to watch, and the more important steps are shown with a silhouette effect in the accompanying illustrations.

The method employed by this spider in laying her lines has been called the "walking-around" technique. It consists in fastening a line, say, the line that will form the top ray of the snare, at a point on one of the framing twigs and then walking around on branches and twigs to the opposite point, spinning the line but holding it free of contact with anything, then drawing up the slack and making it fast. She then may back-track and make the outer or base line of the triangle, following the same method. Then the lower ray is constructed; next, the two center rays. Now the frame is ready for the sticky cross lines, which will make her web the efficient food trap necessary.

The spider starts at the outer and upper corner of the triangle. She makes an attachment near the end of the ray and then slowly spins a heavy line, which is held away from the ray as she proceeds along it toward the apex. When near the apex, she drops down to the second ray, still holding the heavy line clear, and works back to a point below the first attachment at the outer end of the ray, where she fits and fastens the heavy line. She then backs up a short distance (making a "zig"), attaches and again begins to spin the heavy line, which, following the same routine, results in the outer cross line between the second and third rays. After the line between the third and fourth rays is completed in the same way, the spider goes clear around the frame of the triangle by way of the apex to the proper point on the top



ray, and from there starts the second series of cross lines.

When the spider spins the non-sticky lines that compose the rays and framework she moves quickly, and the filament of silk is drawn directly from the spinnerets without any processing. But the manufacture of the sticky cross lines is an entirely different matter. In this case the viscid silk is emitted from a special organ, the *cribellum*, a sort of flat plate with many fine holes, in front of the spinnerets. The spray of silken filaments is drawn out by the *calamistra* (Latin, curling irons), a pair of fine combs on the spider's fourth legs. The result is a thick, sticky, compound thread called the "hackled band." Its manufacture is a rather slow process, perhaps a minute to an inch, and with a magnifier the rapid combing of the hind legs easily may be seen. This is a fascinating process to watch, an example of the marvels of spiderdom.

The males of the triangle spider are somewhat smaller than the females. They make webs of the same sort but abandon them when the mating time comes and seek out the webs of the females. The egg cocoon is not placed in the web but is plastered to a nearby twig and it may be found to contain from half a dozen to a dozen eggs.

The pictures were taken with the high-speed electronic flash invented by Dr. Harold E. Edgerton and associates at M. I. T. In Nature the filaments of the web are so fine that, except in strong sunlight at just the right angle, they are invisible. The same effect, photographically, is obtained by considerable over-exposure. This greatly magnifies the filaments and shows the spider and the branches supporting the web in white silhouette.



# St. Marks: A Zoo without Cages in Florida's Panhandle

By BLANCHE McKNIGHT

**A**LTHOUGH the Everglades National Park has been much publicized, there is another protected area in the Sunshine State that shelters an amazing variety and abundance of native wildlife, including some of the rarest and most beautiful bird species in the United States. This is the St. Marks National Wildlife Refuge on Florida's northwest coast, less than an hour's ride southeast of Tallahassee and a few miles east of the Gulf Coast Highway.

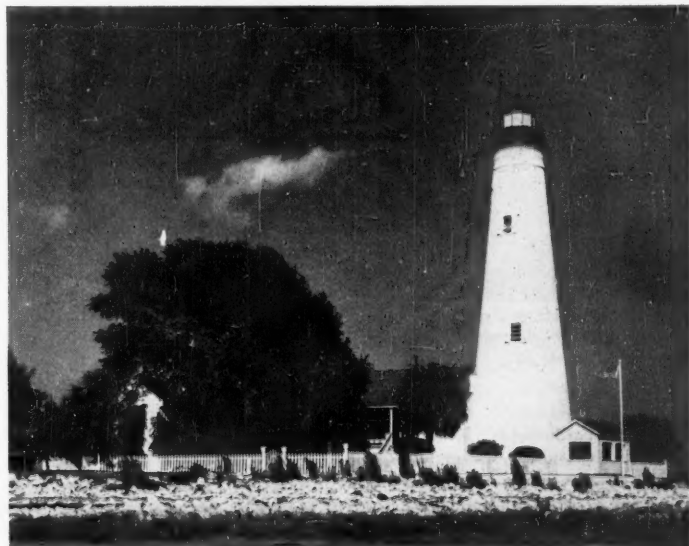
"One could spend a lifetime in the St. Marks Refuge watching its birdlife without exhausting the possibilities," says Herbert L. Stoddard, Sr., ornithologist who has studied the birds of this region ever since 1924. From a recent field trip he reported 121 species observed in an eight-hour period in one comparatively small sector.

With its hundreds of species of birds and widely varied reptile and mammal life, the Refuge comprises some 70,000 acres of jungle and marshland, fringed by a 32-mile shoreline on Apalachee Bay. There are at least 25 varieties of waterfowl, including geese, mallards, scaups



FLORIDA GAME AND FRESH-WATER FISH COMMISSION PHOTOGRAPHS

St. Marks National Wildlife Refuge is one of the few remaining habitats for the Florida black bear. Below is historic St. Marks Light, a landmark of the region of 118 years and now included in the Refuge. Birds have nested or rested near it for many years.



pintails, ringnecks, gadwalls, canvasbacks, wood ducks and many others. Shore birds exceed this total. Upland game birds include such familiar species as wild turkey, bobwhite quail and ground and mourning doves, while cardinals, mockingbirds, rustling chewinks, hermit thrushes, yellow warblers and raucous bluejays flit, cry and sing in the dense green growth, providing an endless symphony of bird music. Predaceous birds number some half dozen, among them the bald eagle — the true American eagle — and the osprey.

So superlative is the thrill of watching at close range such interesting members of the feathered kingdom that the

other denizens of St. Marks Refuge are sometimes overlooked. White-tailed deer are numerous throughout the wooded sections, and fur-bearing mammals abound. The latter group includes the playful otter and the lumbering black bear. Even the cougar, rarely found in the eastern United States, lurks deep within the interior.

Populous and popular among the reptile inhabitants is the spike-backed, personality-plus alligator. There are also cotton-mouth moccasins and rattlesnakes. The trails that wind through the accessible sections of the Refuge are kept safe for inspectors of its fascinating vistas. Often the outdoor enthusiast who observes the first rule of wilderness etiquette — to be mute before its wonders — is able to come within close range of the wild inhabitants. Many varieties of salt and fresh-water fishes crowd the waters of the Refuge, making it a favored spot for anglers.



Many Canada geese spend the winter at St. Marks, migrating from the far North. A banding station records their travels.

No less impressive is the terrain itself, an enchanting area of moss-covered swamps, extensive savannas, open piny woods, cabbage palmettos and hardwood hammocks, or "tree islands," dotted with winding rivers and ponds of fresh and brackish water.

A graded, "all weather" road roughly bisects the Refuge from north to south, ending at old St. Marks

Light, chief landmark of the region for 118 years. Passable roads lead into other areas; the Shell Point, Liveoak Island, Spring Creek and the Panacea districts in the western sector. But the eastern section, for maximum protection of the wildlife, is and will be maintained as a desolate wilderness where transportation is chiefly by boat.

In this area, long before the Spanish invaders reached the shores of Apalachee Bay, Canada geese, ducks, ibises, herons, egrets and other birds gathered in immense numbers. Some, like the geese and ducks, come to enjoy the balmy climate in winter, and others to nest and rear their young.

When William Bartram, English traveler and botanist, visited this section of the Gulf Coast during the Revolutionary War period, he found an amazing abundance of waterfowl. In *Bartram's Travels*, 1791, he reports: "Every tree was loaded with nests and the young of various tribes of waterfowl. It is incredible what prodigious numbers there were, old and young, and the confused and deafening noise they kept up continually."

The modern traveler also finds a tremendous concentration of bird life in the Refuge. Especially is this true in December and January after the Canada geese and other migratory birds have made their appearance.

From 16,000 to 20,000 Canada geese use the Refuge every winter, says Paul Kreaiger, Refuge Manager. Their behavior in the Refuge, where they display almost no fear of man, is in striking contrast to their wariness when venturing beyond Refuge boundaries. Could it be that the geese actually know when they have crossed the line? Dr. Stoddard says that "geese and other wary waterfowl soon learn when and where they are safe, and that Canada geese especially seem to know where the line is, and rise high in the air when passing into a heavy shooting zone."

Before establishment of the Refuge, a few hundred geese frequented the sand flats near the St. Marks Light, under the watchful eye of J. Y. Gresham, veteran lighthouse keeper, who has nursed many a sick and wounded goose back to health in his home by the sea. Now there are many thousands, scattered over a wide area, equally indifferent to man's presence. A not unusual sight, in mid-January, is to see five or six thousand Canadas assembled on a single pond.

Both goose and duck banding stations are maintained on the Refuge. It is through the banding of these migratory birds that considerable information is obtained regarding the several sub-species represented, as well as their geographic points of origin. It is known that some of the Canada geese come to St. Marks by way of Kingsville, Ontario, for at least two specimens banded by the late Jack Miner have been

recovered in what is now the Refuge. The lesser Canada and the snow goose of the far West and Northwest are all visitors.

According to field observers, many species of birds, including finches, warblers, white-winged scoters, white-winged doves, brilliant painted buntings visit the Refuge only occasionally, or use it as an emergency landing place. A storm at sea, or a blizzard roaring down out of the Northwest, causes these, as well as the black rail, the skimmers, golden plovers and others to stop over for a brief visit with the geese, ducks and other regular winter residents.

Another period of great activity occurs in April and May, when the nesting season is in full swing. At this time the Refuge provides more excitement and glamorous raiment than does Miami Beach at the height of the winter season. Squadrons of adult birds are continually bringing in food, others wheel overhead in soaring, lazy circles. Below, on the shallow ponds and salt marshes, long-legged blue herons, black-necked stilts and other wading birds stalk among the flat green lily pads in search of food. Some dive for and others stealthily run down crayfish, killifish, minnows, snails, frogs and occasionally a baby alligator.

In the days before the Refuge, especially at the turn of the century, this natural haven for wildlife lured hunters of the egret, the limpkin and the alligator, and trappers of fox, otter and other animals.

Later the densely wooded sections were exploited by lumber and turpentine interests. Old-timers like "Grandma Shields," in the nearby village of St. Marks, still recalls the days when the "bird on Nellie's hat" was the height of fashion, and when the exquisite bridal plumage of the egret was ruthlessly torn from the bird, leaving it and its nestlings to die. Plume hunters almost exterminated the egret until public opinion was aroused to abolish the cruel fashion, and protection was extended to this and other rare species.

Among these was the limpkin, or wailing bird, so nearly extinct that it is found in only a few places in North America. In certain sections of St. Marks

Refuge, it is now nesting regularly, and its plaintive call is frequently heard. A large, olive-brown bird, spotted with white, the limpkin does not migrate, but stays close to its chosen home. Its weird, "Aow, Aow," has been likened to the wails of a patient having a tooth extracted, or someone in distress. Many



Mallards are among the numerous species of ducks that find winter resting grounds on the Refuge.

a superstition is linked with the limpkin. "It would not be difficult even for the most prosaic person to imagine that some lost soul had come back to earth," says Dr. Raymond F. Bellamy, of Florida State University's Department of Zoology, who has made an extensive study of the birds of this region.

From the time the visitor enters the wildlife habitat at Plum Orchard, historic campsite of Seminole Indians, and perhaps the ancient Apalachee before them, until he reaches the St. Marks Light, twelve miles away, he feels transplanted into another world. Rising above the purring of the car are the rusty-pump whooping of the Florida sandhill crane and the far-reaching drumbeats of woodpeckers on dead tree trunks. The discordant squawks of herons, the chattering of fox squirrels, and the sweet-calling cry of the wood duck is heard. The wood duck remains the year round.

In the drainage ditches bordering the roadway, little white herons and other waders stalk among the hyacinths, bladderwort and pickerelweed in search of food; snapping turtles and alligators sun themselves on half-submerged logs, and occasionally a water snake's head curves in a ripple like an arrow. Red-shouldered

hawks fly parallel with the car as if racing with it, and swooping almost within arms' reach before taking off across the marshes with shrill cries, which contrasts strangely with the whir of egrets' wings taking sudden flight across the cypress-covered swamps. High overhead squadrons of white ibises soar together in military lines at great heights, on motionless wings. With their long, red bills and legs stretched to their full extent, the dazzling white of their plumage in the bright sun contrasts dramatically with the jet black of their prime wing tips. A cloud of white birds whose legs do not trail behind will turn out to be white pelicans.

On the ponds and lakes, a few hundred yards from the roadway, hundreds of coots, likewise migratory birds, skim the surface of the water awkwardly before taking off, and purple gallinules and ruddy turnstones ignore the passing cars.

Perched high on a limb, above the water, peacefully sits a pair of anhingas, or water turkeys, those curious looking but handsome glossy-black birds with long serpent-like head and neck. At the approach of the car they drop into the water, submerging all but sinuous neck and head. When swimming they truly resemble a water snake twisting and twining along. Sometimes, when threatened with capture, the "snake bird" submerges completely, and when it finally reappears, it often does so with neck pointed straight upward to simulate a stick. This trick has deceived many.

Another peculiarity of the anhinga is that, although highly aquatic in habits, these birds have plumage that is not water-repellent, and when the adults are thoroughly soaked from underwater fishing, they are unable to fly and must crawl up on a perch where they can dry out. But this lack of water-resistant plumage

does not seem a great handicap in securing food. Their extraordinary fishing skill earns them much leisure, and for hours on end they sun, preen and loaf on dead trees and other perches in the vicinity of their fishing grounds.

Perhaps the most amazing thing about the "snake bird" is its ability to climb trees, using its long neck and wings. According to ornithologists who have witnessed this unusual feat, it is usually indulged in by the downy young, not yet able to fly, when disturbed by man.

The alligators in the Refuge are always a source of great interest to the visitors. There are more than 1000 alligators in the Refuge, including all sizes, from babies around a foot in length to the big fellows ten and twelve feet long.

In the heat of the day the 'gators sun themselves on old cypress logs or float like rough-barked logs on the dark waters. At night their protruding eyes shine like huge rubies when caught in the rays of a flashlight.

Writing of his observations during a canoe trip down the St. John's River in 1765, Bartram records, "Alligators were in such incredible numbers and so close together from shore to shore that it would have been easy to have walked across on their heads, had the animals been harmless." During the 19th century it was discovered that alligator hide was an excellent material for shoes and luggage, and the great slaughter was on. 'Gators are often called or "grunted up," by making a deep guttural call, like the croaking of a frog. National refuge status has stopped this wholesale massacre at St. Marks. Today wildlife is protected in this Florida sanctuary where man, the great destroyer, may come only to observe, to admire, and to marvel at Nature's inimitable wonders.

## Tableau

By CHRISTINE RIDDLE

The hemlock's head is wrapped in white —  
A hood like Mary wore.  
In white the stream is blanketed,  
The ground is froze.

The wood's broad shoulder wears a brown  
The shade of Joseph's cloak —  
The smoky brown of thorn trees,  
Of willow, alder, oak.

The timid chipmunk, vole and hare  
Have come the shepherds' joy to share,  
And sumach lamps are still aglow  
To light the cradle in the snow.

The sun prostrates to offer gold,  
The wild winds hold their breath,  
But a tall tree opens wide its arms  
And sighs "I offer death!"



# The Bull-Head Orchid

By ALEX D. HAWKES

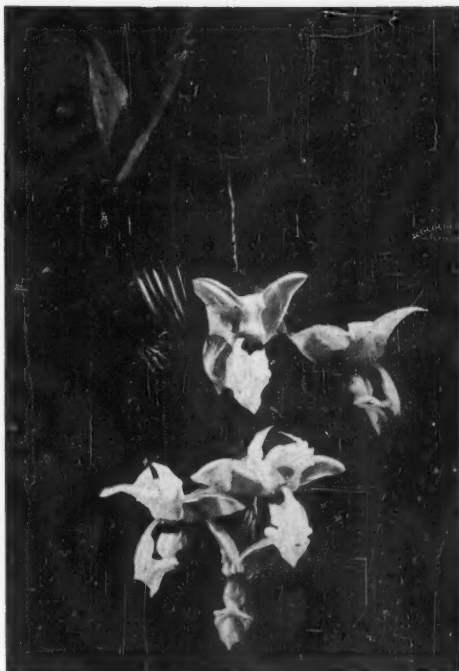
**T**HE thousands of species of flowering plants that have been placed by botanists in the Orchid Family exhibit more extremes of variation and complexity of form than any other aggregation of phanerogams. Many of these orchids, although of no particular value from a commercial standpoint, are frequently seen in collections, because of their esthetic appeal or their downright peculiarity.

One of the most fantastic of all orchids is the so-called bull-head orchid of Brazil, known to science as *Stanhopea graveolens*. This plant, which grows as an air-plant, or epiphyte, on trees and humus-laden rocks in its native haunts, is a rather frequent inhabitant of present-day orchid collections, being prized for its abundant, large, showy flowers, which are exceedingly complex in structure and deliciously fragrant. The blossoms are further odd in that they are produced from the base of the plant, and force their way downward before they open. Because of this eccentricity, the specimens must be cultivated in open baskets, or on rafts of osmunda fiber, otherwise the blossoms will penetrate the compost of the pot and actually attempt to open there!

The bull-head orchid has been known to science since 1840, when it was described by the great English orchidologist, John Lindley, from material collected in Peru. At that time Lindley had an interesting comment to make: "Its odour is so powerful that it communicates itself to the fingers after touching the flowers, and like many other smells, though agreeable in itself, is offensive in its intensity."

This orchid has a particular penchant for growing on rocks, where it often forms large dense mats, with many hundreds of the pseudobulbs characteristic of its genus and great tangled masses of roots. Many of these roots give rise to small, erect projections of surprising sharpness. These aid in the collection and retention of leaves and other bits of debris that may fall on the plant. Thus a little naturalistic garden in this humus is gradually built up, and other orchids and fellow air-plants may enter into the cluster of this *Stanhopea*, creating an attractive and interesting formation. One such clump of the bull-head orchid near Rio de Janeiro contained, besides the large orchid, seven other kinds of these plants (two of which were also in flower!) and more than a dozen different kinds of ferns, mosses, bromeliads, and peppers!

The flowers of the bull-head orchid are characteristic of the genus in their extreme complexity of form and bright coloration. They reach a diameter of more than five inches, and when fully developed are dull straw-yellow, sometimes more or less liberally dotted with crimson. The large fleshy labellum is a mixture of hues, rose-red, white, orange-yellow and glittering crimson figuring in its makeup. These blossoms open in a most peculiar manner, generally in the early morning hours.



PHOTOGRAPH BY OCTAVIO FONSECA

The large bloated buds, which attain a gigantic size before expanding, suddenly split and the flower opens with a decided snapping noise. Immediately the initial whiff of the fragrance is released, and in a short while the flower is mature and ready for pollination.

Dr. F. C. Hoehne, famed Brazilian student of the Orchid Family, has made some interesting observations on the pollination of this plant. He states: "The pollination seems to be effected particularly by the hummingbirds, who explore the cavity at the base of the labellum in search of the larvae of insects, small spiders and aphids, which they capture and consume. The structure of the flowers seems to confirm this suspicion, because they are all borne in a pendent position, thus having the lip and the column below and located in a way to facilitate the work of the birds. . . The space between the end of the column and the epichil (a part of the labellum) is almost always a small one, and it is not rare to find that the horns on the mesochil (labellum-part) force the hummingbird to thrust his head between them in order to reach the hypochil (labellum-part, in which the nectaries occur). In doing this, therefore, the head will touch the anther, and on withdrawing it, he will remove the pollinia (pollen-masses) which remain adhering to the beak in the region of the nasal cavities."

These handsome and exotic orchids, although not as showy as the cattleyas of everyday commerce, are nevertheless fascinating in the complexity of their ways.

# "The Witch Tree"

By ROSE D. MEYER

ONE OF Minnesota's oldest landmarks is a wind-twisted cedar known as "The Witch Tree." For more than 300 years it has braved the elements that storm the north end of Hat Point on the scenic Lake Superior North Shore. Long ago, early traders and Indians glided by this point of rocks in their swift canoes on the way to Grand Portage, four miles distant, western headquarters of the Northwest Company organized in 1778, absorbed into the Hudson Bay Company in 1821, and recently set aside as Grand Portage National Historical Site. Its huge stockade in the yard, where thousands of canoes once were placed, now has been restored, and buildings erected by the Minnesota Historical Society on the site of the original ones follow the early pattern.

The trail leading to the ancient "Witch Tree," four miles from Grand Portage, winds through dense forest that sweeps down over high granite cliffs to the water's edge. To get to the tree one follows a ghostlike trail. Gulls wheel and cry overhead, and the crystal-clear water of Lake Superior laps the craggy shoreline, just as it did when this strangely gnarled cedar was a sapling on the rock that juts out into the Lake toward which it now leans. The upper branches are bare and bleached. The lower ones bear sparse evergreen foliage bearded with graying hairy moss. And the distorted roots give the appearance of weird old serpents intertwining the natural granite pedestal.

In the old days Indians made round-about portages to avoid passing this awesome tree. They believed it harbored an evil spirit in the form of a dark brown eagle-like bird with huge wide-spread wings and vicious beak and claws. Only in large groups would they ven-



PHOTOGRAPH BY M. J. HUMPHREY

"The Witch Tree" near Grand Portage, Minnesota. Its past is rich with Chippewa legend and it is an ancient landmark.

ture to approach it, and then with drumming of tom-toms, and songs and gifts of tobacco, which they deposited in an opening in the base to propitiate the evil spirit.

However, it is said, the coming of the white man with his guns scared the evil bird and it fled. Nevertheless, for many years the tobacco offerings were continued, just to make sure of good faith and good luck on hunting and trapping expeditions in the environs.

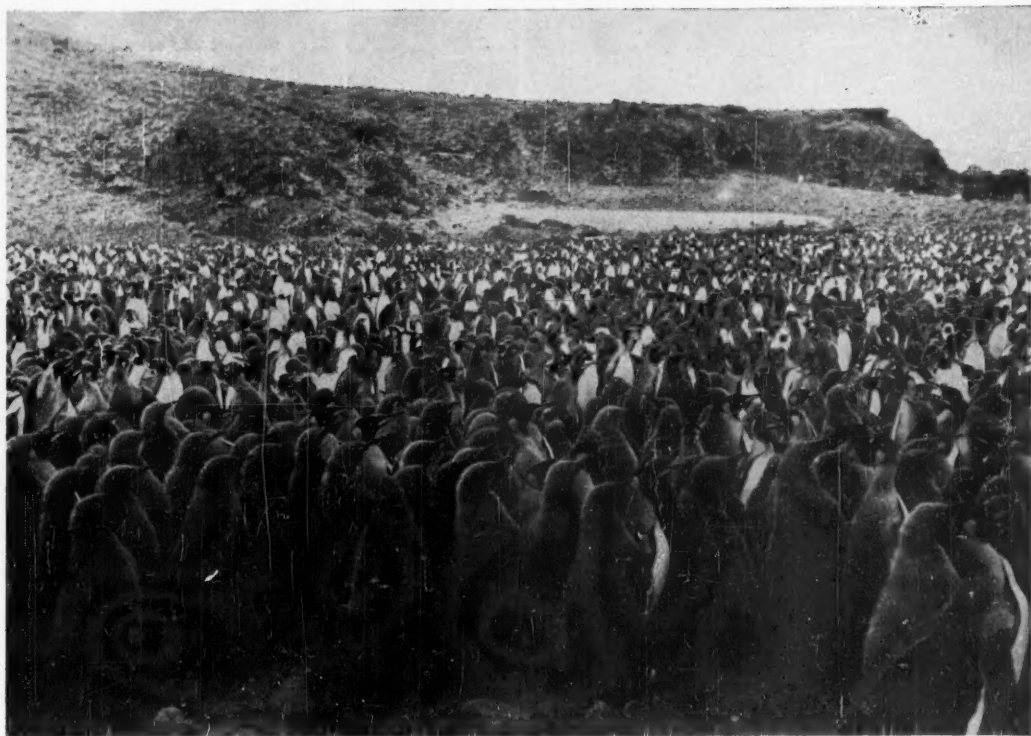
Chippewas, still living in Grand Portage, tell the legend of The Witch Tree, and about their grandfathers, who were among those who deposited tobacco by the ancient tree.

## The Pelican

By HOWE WILLIAMS

In Indian file the Pelicans,  
Ungainly feathered Calibans,  
High above the wrinkled sea  
Glide and flap alternately.

While on the beach in solitude  
In some pensive interlude  
An ancient glutton, never quick,  
In studies like arithmetic,  
Tries to reckon up his prey —  
How many fish he ate this day.



King penguins in convention assembled on Marion Island. They breed in "rookeries" of thousands of birds, hatching their eggs in folds of flesh between their legs and building no nest. The hard and level beaches near the water are favored spots. At the left a penguin youngster struts proudly.



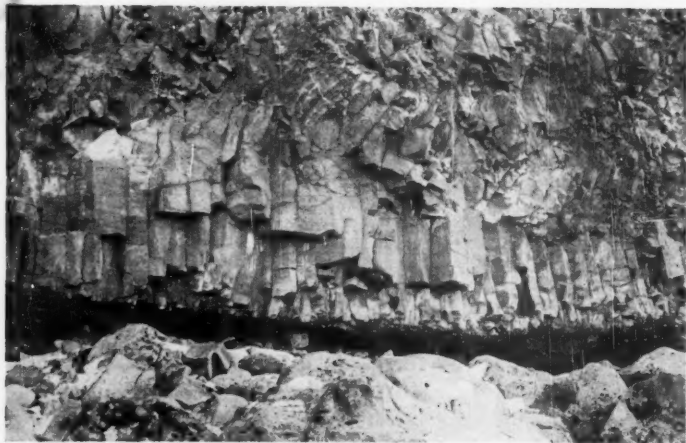
## Marion Island

By ALLAN B. CRAWFORD

**M**ARION Island is the larger of two uninhabited islands in the South Indian Ocean known as the Prince Edward group. The islands, which are of volcanic origin, are the breeding places of hundred of thousands of sea birds. Albatrosses, petrels and four different species of penguins nest there in large colonies. Sea elephants up to fifteen feet long are also numerous. These enormous seals suggest great slugs. They lie in groups on the beaches and only move slowly and with difficulty over land. They are moderately tame, but when approached, they lift their cat-like heads, open cavernous mouths, and hoarsely roar at the intruder. Occasionally fur seals and sea leopards from the



Three Sister Hill on Marion Island, above. These islands are of volcanic origin, consisting of a main, central cone and surrounding craters, some of which are filled with crystal-clear water, which becomes solid ice in winter. At the right, wind-swept moss on East Cape, Marion Island. Trees and shrubs will not grow, but grass, ferns and mosses do thrive, carved by the wind into fantastic patterns. Below are basaltic rock masses crystallized from the volcanic eruptions of an earlier day. This formation is at Sealer's Cave on Marion Island.



south are also seen, and the killer whale or grampus is often met in small schools between the two islands of the group.

The lower slopes of both islands, roughly circular in shape, although grass-covered, are unpleasantly marshy, which makes walking from place to place difficult and dangerous.

The highest point on Marion, known as Jan Smuts Peak, is 3890 feet above sea level. Composed chiefly of rock and volcanic cinders, the upper slopes are snow-covered throughout the year. Icebergs are sighted at times in the winter months, for the temperature of the

sea is never many degrees above the freezing point. The islands, which are situated well within the area known by the mariners as the "roaring forties," have an unpleasant climate, for strong gales and heavy seas are common throughout the year. Snowfalls during December and January (mid-summer) are often experienced, and the daily sunshine period seldom exceeds two and one-half hours. In winter, of course, it is much less.

There are no sheltered bays or harbors. During the nineteenth and early twentieth centuries, however, the islands were visited occasionally by whalers and sealers



from the Cape. Parties of men were put ashore to collect sea elephant oil, which they found was a valuable substitute for whale oil. These men slept in caves, or built primitive wooden huts. No trees of any description grow on these islands, so wood had to be brought from South Africa for the purpose. Their hardships and sufferings were great, and sometimes man was not able to withstand the stronger forces of Nature. Ships and boats were wrecked on the islands' inhospitable shores, and scurvy also took its toll. There are several graves on the islands, but most of those who lost their lives were victims of the sea itself.

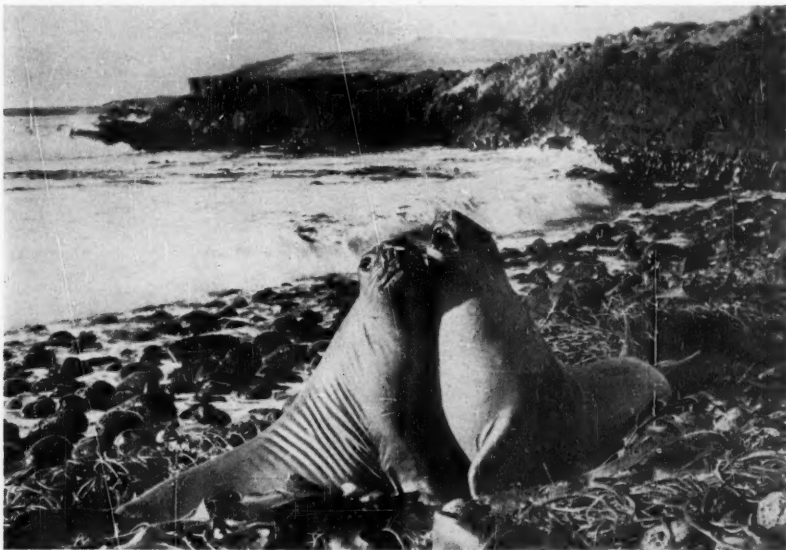
Great Britain has always been the recognized owner of the islands of the Prince Edward group, but the nearest inhabited land is southern Africa, one thousand miles to the north-west.

The advent of rocket projectiles and other modern weapons of war caused the British and South African governments to appreciate the military value of the islands. In a future conflict some hostile power might use them as a valuable link in communications. South Africa would thus be placed in a precarious position. Consequently the British government recommended South Africa's annexation of the islands so that they would not fall into undesirable hands. This was readily agreed upon, for quite apart from matters of defense, they would be useful from a meteorological aspect.

So in December, 1947, a frigate of the South African Naval Forces proceeded to each island, planted the Union flag on each, and left a small, temporary occupation force under



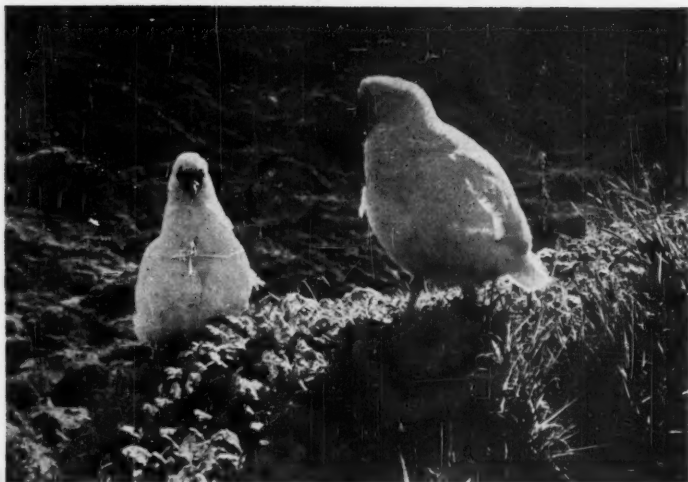
Gentoo penguin mother and her chicks on a grassy hummock on Marion Island. Sea elephants are also found on the beaches of the island.



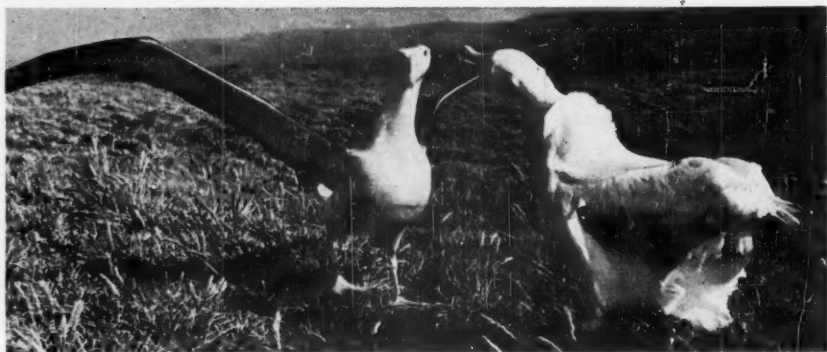
canvas on the larger — Marion Island.

Eventually it was decided to erect a permanent meteorological and wireless station on the island. In relays, two cargo vessels and further units of the South African Naval Forces arrived with stores, lumber and personnel, and a construction party was put on shore to complete building operations.

The lack of beaches and other landing facilities hindered progress considerably, and when materials were put

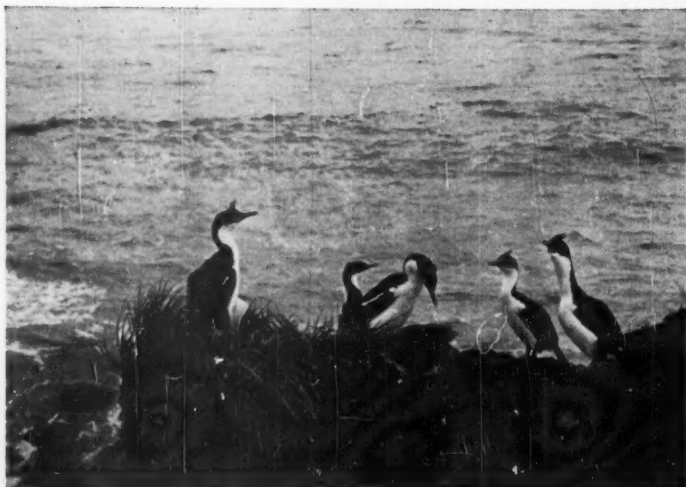


The paddy, or sheathbill, *Chinarchus minor*, is the only bird with unwebbed feet found on Marion Island. They are quite tame and are scavengers, living on refuse from the penguin colonies. The wandering, or lone albatross breeds on the Prince Edward Islands. Below, two birds in a courtship dance on Marion Island in January. At the bottom of the page are Kerguelen cormorants, found in small numbers on the island. They are rarely seen flying over land, seeming to prefer to fly over water even when it is not necessarily the shortest distance between two points.



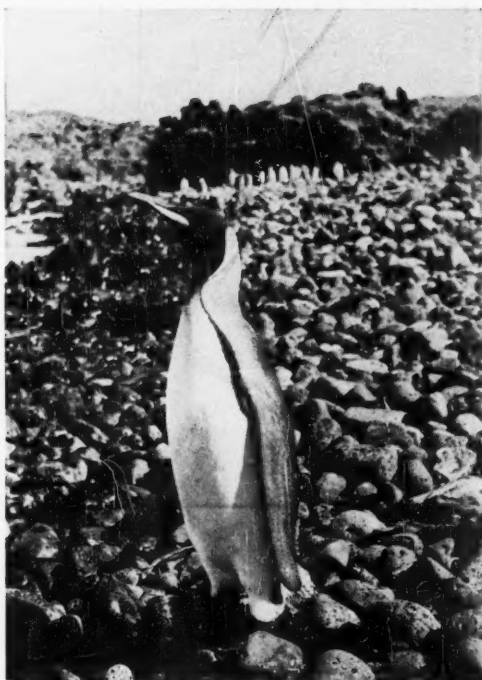
ashore, there was the swampy nature of the ground to contend with. Like the sealers, the men slept in the shelter of the cliffs, and wood was landed with which they constructed temporary buildings. Snow, rain and strong gales, usually from the west, also contributed to worsen the position, but in face of all hardships, the newly formed "village" of five strong wooden houses, was ready for occupation in March, 1948.

The construction of buildings on swampy ground naturally presented many hazards not previously considered. So the houses were bolted to large wooden piles, which were sunk into the ground for foundations. The men, too, had to adapt themselves to meet local condi-





Different Marion Island residents, a sea elephant in the foreground, a paddy right behind it, and a gathering of young and old king penguins. At the left, a rock penguin, another of the penguin species on Marion.

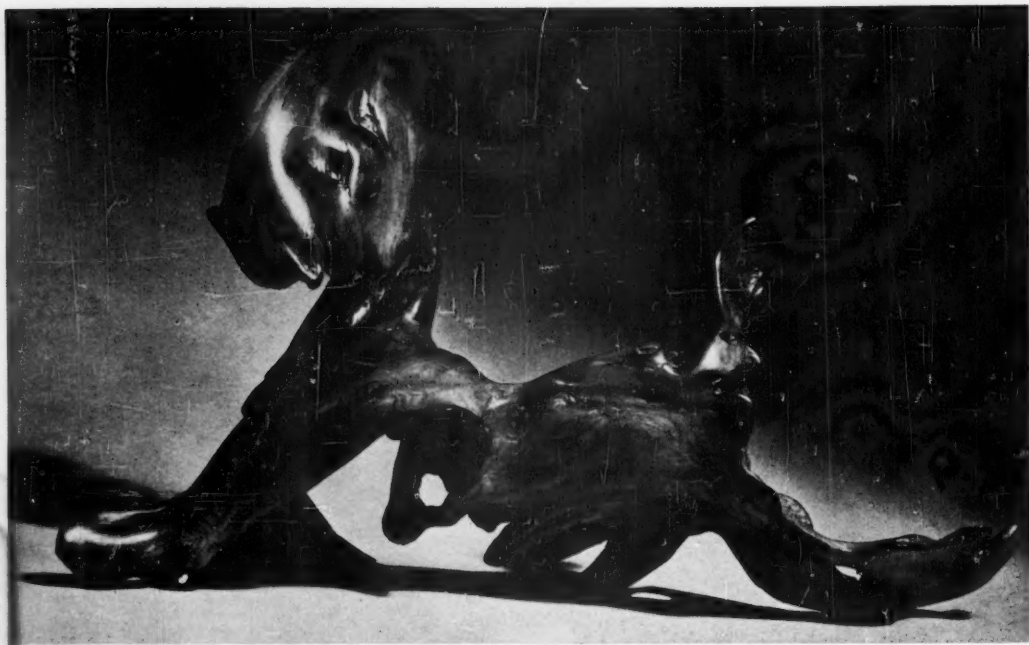


tions; heavy seaboots to keep the feet warm and warm clothing as well as oilskins were issued to all.

When all was ready, the permanent party moved in. There were four South Africans, a meteorological officer in charge (the writer), a radio mechanic, a wireless operator and a medical orderly — and six Tristan da Cunha islanders, who were to act as laborers and general handy-men. These latter had been brought especially from the island of that name in the South Atlantic. Three of the four South Africans had previously spent some months on Tristan da Cunha, so the Marion island party, with the six islanders, was a meeting of old acquaintances.

These ten were the sole occupants of the islands throughout the winter of 1948, and are believed to be the first persons ever to have remained so long there. Weather reports were sent by radio regularly twice a day, and communication was also established with a similar Australian expedition on Heard Island 1000 miles away. In fact, communication with them was so good that we played a game of chess by radio against them, each day one new move being signalled by wireless between us. The result of the match after three months was a draw.

During our seven months stay a collection of twenty-two species of Antarctic birds was made. Twelve of these had never previously been observed in this vicinity. This work was therefore a valuable scientific record. A skin of the rare blue petrel was also brought back for exhibition.



## Sculpture in Nature

By ELISE MANNEL

**C**ORNELIA Prins Chase of San Francisco, former teacher of languages and music, is not a sculptress but a discoverer who exposes the forms wrought by Nature in the roots of juniper, manzanita, cedar, and other trees indigenous to the high mountain ranges of California. Every year she camps for three months high in the remote fastness of the Sierra. In the fall she returns before the first snowfall, bringing a station wagonload of loot — great pieces of weathered roots, gnarled and encrusted with earth and debris. This is the rough matrix from which she extracts her treasure, working with mallet and saw, chisel and sandpaper, to bring out natural forms buried in the wood.

All kinds of abstract designs, and many that suggest actual themes; such as flight, waves, flames, fish, animal forms, seaweed, victory, Madonna, combat, and a hundred others, emerge in the wood forms exposed by careful craftsmanship.

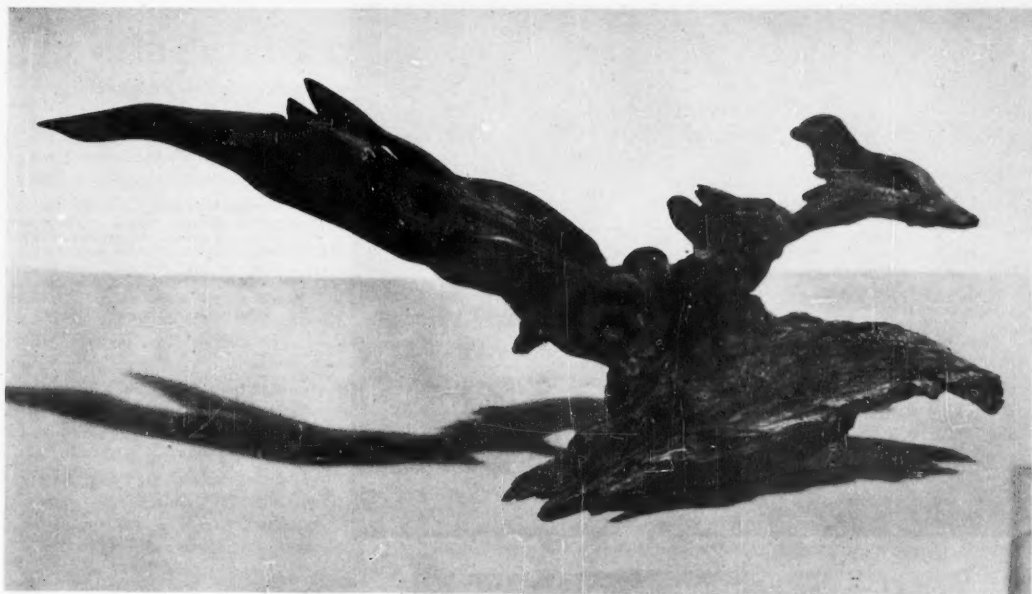
In size the "sculpturings" vary from miniature pieces that measure an inch or smaller, to great epic forms spanning six feet or more, as rhythmic and complex as the wave designs seen in old Chinese paintings.

Mrs. Chase does not distort the forms or impose concepts of her own; her aim is to allow the inherent structure of the wood to express its own characteristic trend. The forms that are released show an endless variation, not only in design but in structure, texture, color, pattern, movement and scale. Just as Nature makes the whorls on no two fingertips alike, so Nature's improvisation in form and rhythm provides infinite variety of sculptural pattern and shape in wood.

The picture above is described as a canine conundrum in wood, or is it a playful horse? Below, Mrs. Chase, an accomplished musician and linguist, finds Nature a composer of rhythmic form in wood. Here she begins to file away the dead wood in order to bring out the natural form of a piece of Nature's wood sculpturing brought back from the high Sierra.

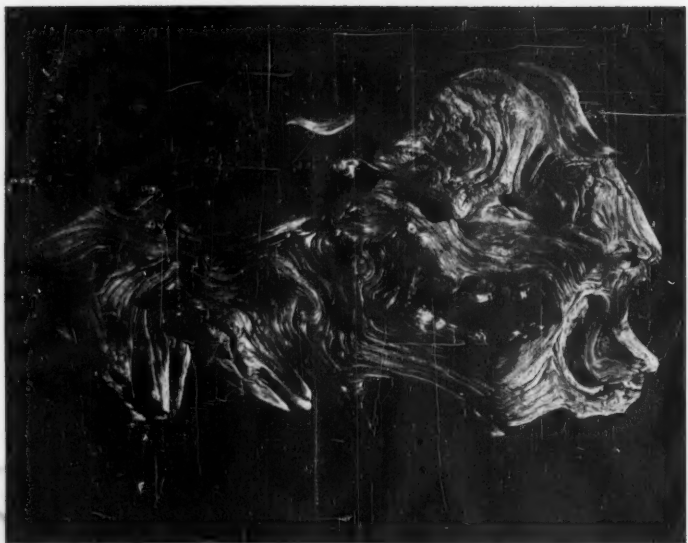






"Bird in Flight" is the title given to the sculpturing above. It was a beautifully weathered green-gray, polishing bringing out the fine grain and the rich brown color of the juniper that had been struck by lightning and from which the specimen had been obtained. Below is an abstract form that is of the type that can be used effectively in connection with the arrangements of flowers.





The contorted formation at the left suggests a primeval dragon to some, and others see different representations in it. Below, left, is a wood fragment that, when finished, suggests "The Eternal Feminine." Below, right, is an intricate and graceful linear pattern in a form that makes an attractive ornament.



## "Fitting and Proper"

ON THIS page, where so often we are compelled to face controversies, it is quite satisfying for the month of Christmas this year to be able to discharge our editorial responsibility by commenting on a significant step in understanding and agreement.

As our vice-president and business manager, who likewise is the treasurer of the Natural Resources Council of America, reports elsewhere in this magazine, this achievement is the recommendation by the representatives of our leading conservation and related scientific organizations of a common policy for renewable resources. This policy, while not yet publicly announced, is a ten-point declaration of principles that would be adopted by the nation "in order to provide the means for a high standard of living in a healthful environment," through the wise use and preservation of our renewable natural resources. Its recommendations were agreed upon by the members of the Natural Resources Council at its 1951 annual meeting in Franklin, North Carolina, near the Nantahala National Forest, last October, for formal presentation at the North American Wildlife Conference to be held in Miami, Florida, next March.

After living and working for more than a quarter century within and among conservation organizations, we know what a difficult thing it is to achieve an agreement thus on a comprehensive policy among the many groups that — despite their all working devotedly in the public interest — are so diverse in their special and particular concerns. For five years now we have watched with increasing faith the efficacy of the Natural Resources Council in uniting these organizations for the better realization of the purposes which they do have in common, and we feel that the Council's success in bringing about the common recommendation of a national policy for all renewable resources is one worthy of gratitude from all conservationists.

A year ago the Council at its 1950 annual meeting succeeded in adopting "a platform and preliminary plan of action" based on a recognition that "resource management must be considered not only in its separate categories, but in its entirety." The Council then established as a No. 1 objective the "adoption of a national policy by the Congress of the United States to secure in the public interest the maximum benefits from the nation's land, water, and related natural resources." And the members of the Council determined then to "cooperate in the preparation of a comprehensive statement and policy designed to insure the permanent wise use of land, water, and related resources and the preservation of natural park and wilderness areas."

The outcome of this determination is the policy now adopted and soon to be publicly presented. It is the result of many efforts during the past year by a special committee of the Council and by the Council itself at a mid-year meeting during the Milwaukee gathering of

the North American Wildlife Conference last March. The substance of this policy (it is our faith based on an acquaintance with those who have fashioned it) will be sound, and deserving of the most earnest consideration in the public interest — although, as it happens, we have not ourselves at this writing seen the full text of the policy. Our concern at the moment is rather with the fact of the achievement by the members of the Natural Resources Council, not only in agreeing that there should be such a policy, but in adopting one and then individually accepting and endorsing it.

It now behooves the individual members, the boards of directors, and other officers of the several organizations represented in the Natural Resources Council to ratify and deepen the agreement their spokesmen have achieved. We urge them to do so. We hope that the representatives of these organizations (some three dozen in all) will come with enthusiasm to the North American Wildlife Conference next March ready to join with their colleagues in presenting to the public, for consideration by Congress, a sound policy supported by conservationists united.

More and more, individual conservation organizations have recognized that the success of their special endeavors is dependent on an integration of their programs into broader ones including the interests of other organizations. More and more, a recognition of the interdependence of all conservation programs has been growing. Still ahead is a similar recognition on the part of the general public of the dependence of our whole society, our very way of living, on a sound conservation philosophy and program. We must hasten it. Certainly, a common understanding publicly avowed by the many groups who approach conservation from so many different points of view should contribute to the acceptance of conservation as public policy. A year ago the Natural Resources Council introduced its platform and preliminary plan of action with the statement: "There is today a growing awareness of the fact that land, water, the living resources, and man are intimately related." We must see that this awareness keeps on growing.

Perhaps at this season it is not too much to hope, also, as actively as we can, that not only among the various kinds of conservationists can we reach a common agreement but likewise among the various groups within our whole body politic. After all, even from the viewpoint of conservationists, we shall succeed in our ultimate objective only when it becomes the objective likewise of those apparently specially interested groups with whom conservationists now so often find themselves in conflict. And if such concord as we thus seem now to be visualizing can become ours in our own country, who knows how nearly universal it might eventually become, how steadily we might, even as conservationists, in our workings for common understanding and agreement among ourselves, thus be approaching a real peace throughout the earth, among men of good will? Surely it is worth considering.

# The Rock Nobody Knows

By EUGENE W. NELSON

*Photographs from National Gypsum Company*

★

**Quarrying operations in a Nova Scotia gypsum quarry.**



**T**HERE is a rock that was used in the pyramids of Egypt and is today used in your toothpaste. It is a rock that helps peanuts grow and makes snowstorms for the movies. It is used in mushroom beds and in the walls of your home. Yet not more than one person in a hundred knows its name. It is gypsum, or calcium sulphate, as the chemists call it, and it is truly "the rock nobody knows."

This lack of general knowledge about gypsum is all the more strange when it is realized that more than nine million tons of gypsum were used in the United States alone last year, and that we are surrounded by gypsum products right around the clock, and from the cradle to the grave. Moreover, gypsum is no "Johnny-come-lately" because it has been known and used for thousands of years.

Early in the history of the human race, men learned to build houses from stone and then fill up the chinks between the stones with mud. Later, men discovered a way to make plaster that was superior to mud by grinding up certain kinds of rock, burning the dust, and mixing the resultant powder with water. The material first used for plaster was lime, but a better material was soon found — gypsum. In fact, one of the root words from which "gypsum" comes is an Arabic word "jibs" meaning "plaster," or "mortar."

In addition to having been used in early times as a plaster for both huts and palaces, gypsum was used in the Egyptian pyramids and is referred to in the ancient cuneiform script of the Assyrians. The Greeks also used it extensively. One transparent, mica-like form of gypsum they placed in their temple windows. They discovered that the sun, shining through this material, graced their altars with the effect of moonlight. Hence,

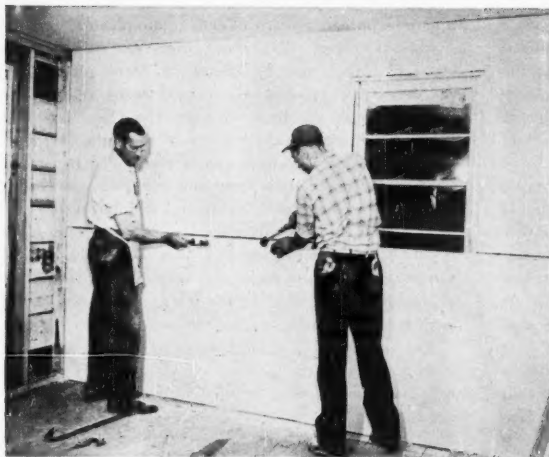
they named this material after Selene, their Moon Goddess. Today, the mineralogical term for this particular variety of gypsum is Selenite.

Another famous type of gypsum is composed of tiny crystals, packed so closely together in the rock mass that the entire mass has a satiny appearance. It is known as "satin spar." When satin spar is exceedingly fine grained, it becomes that material which for ages has been used by poets to indicate the whiteness of their lady loves' brows — alabaster. For ages, too, alabaster has been highly prized as a material for making statues, vases, and other objects of art. Sometimes alabaster is pure white; at other times it is veined and tinted with blue, pink, and other hues. Since alabaster is a rather soft material, it is easily carved and this feature, of course, made it even more attractive to the early statuary makers. Many of the temples and palaces of by-gone ages owe much of their beauty to the alabaster statues that lined their halls, as well as to the white plaster made from the more common form of gypsum.

Despite the vast amount of gypsum used every year in hundreds of different ways, we do not have to worry about running short of this "unknown rock." In fact, if any natural resource could be said to be "unlimited," this term could well be applied to the gypsum deposits in the United States.

These deposits are found in two principal belts. The first belt starts in southwestern Texas and runs up through central Kansas, across Iowa, into southern Michigan, then turns and runs along the northern edge of Ohio and finally into New York State. The second large belt starts in the Imperial Valley of California, goes up through Nevada, and fans out into Utah. These





Gypsum wallboard being used in construction work. Actually, this type of wallboard is "pre-fabricated plaster." Because of its economy and long-lasting properties, it is coming to be used more and more even in the higher-priced homes.

belts range in width from one mile to 200 miles. So there is little fear that our supply of gypsum soon will become critical.

Even the geological origin of gypsum is "unknown" for a certainty. One theory, however, claims that these vast deposits were formed in ages past by a complicated chemical process. Most rock masses contain iron pyrites, or "fool's gold," which is a combination of iron and sulphur. Rain falling on iron pyrites forms sulphuric acid, which seeps down into the ground and strikes rocks lying underneath the surface. In case this sulphuric acid comes into contact with limestone, which is made up mainly of calcium, a reaction takes place resulting in the formation of calcium sulphate, or gypsum. Since both limestone and iron pyrites are common minerals, this theory also accounts for the widespread deposits of gypsum.

Gypsum usually occurs in veins or ledges. Frequently, these have been weathered away and the gypsum itself has been washed into adjoining depressions in the form of sand mixed with earth. This sand is usually called "Gypsite" and makes good plaster. The White Sands Proving Ground in New Mexico, where the first atom bomb tests were made, is actually a Gypsite deposit.

Gypsum crystals contain quite a bit of water, which mineralogists call "water of crystallization." This water content is highly important in certain uses to which gypsum is put. Today, most of the gypsum that is mined is immediately crushed into powder by huge

Most of the powdered gypsum rock — Plaster of Paris — is mixed with wood pulp and other ingredients and then made into wall board, building lath, and other materials. Here we see an unbroken length of gypsum wallboard traveling through the plant towards the cutting machines, where it will be cut up into shorter lengths.

grinding machines. From these machines, the powdered rock is poured into kettles twenty feet in diameter and towering more than that distance into the air.

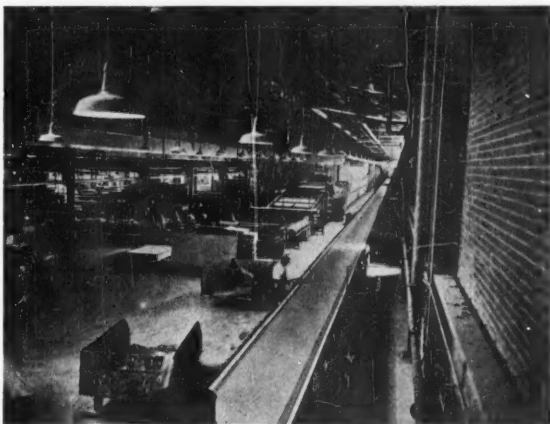
These pots are heated from below, just like the tea kettle on your kitchen stove. As the gypsum powder hits the hot bottom of the kettle the rock begins to boil like hot soup, bubbling at the top of the mass as its water of crystallization is evaporated. The gypsum is heated in this manner until it has lost three-fourths of its total water content. Then the

kettle's bottom swings open and the hot stone powder flows through pipes to the "tube mill."

The tube mills consist of large, revolving, steel cylinders filled with steel balls. These balls, rolling over and over, grind the gypsum into an exceedingly fine, white powder. This powder is commonly known as "Plaster of Paris" because for many years the world's supply of it came from the huge gypsum quarries north of Paris, France.

When water is added to the powdered gypsum, it makes a mortar, or a pliable mass that can be formed into any desired shape and hardened, retaining the shape given it while still pliable. Actually, the Plaster of Paris becomes a hard, rock-like mass because it has been transformed back again into the rock it was before it was heated, or "calcined." Gypsum is the only natural substance known that can be restored in this way to its original rock-like state by the addition of water alone.

When this great secret of Nature was discovered, it



did not take man's ingenuity long to put it to work in a variety of ways. Just how well gypsum serves us can, perhaps, be best appreciated by seeing a few of the ways in which gypsum serves us during the average day. First of all, there is your toothpaste. Gypsum forms the basis for some of the best known brands of toothpaste, and in this way helps to pay the salaries of certain famous radio comedians. Most of the fixtures in your bathroom were made of clay formed in a mold of gypsum plaster. And the chances are that the tiles of the wall are set in another type of gypsum plaster.

When you light the gas stove to cook breakfast, you use a match that has ground gypsum in its head. At the breakfast table, too, you use plates, cups, and saucers, which were shaped on, or in, a gypsum plaster mold. Of course, the walls and ceilings in your home almost certainly are made of gypsum plaster, and that plaster was probably applied over gypsum lath. This insures your comfort and safety because gypsum is strong and, more important, is fireproof.

When you leave home for work, school, or play, you step out on sidewalks made of Portland cement, which contains a certain amount of gypsum to make the liquid cement "set" properly after it has been poured. At school, the chalk you use is not true chalk at all but soft gypsum plaster molded into sticks.

When you drive downtown, take a look at your car windows. They are made of clear, sparkling plate glass. To make this beautiful glass, panes or ordinary "window" glass are set rigidly on iron tables by means of Plaster of Paris and then polished on both sides with fine sand and rouge, an operation which gives the high sparkle and clearness characteristic of plate glass. In your car, too, many of the small metal gears and other metal parts were cast in gypsum molds by a process that was largely perfected during the last war.

When you go to the dentist, he may use a gypsum dental plaster mold in which to cast a bridge. Your doctor, too, builds splints for broken legs and arms from

a gauze impregnated with "orthopedic plaster."

And so it goes. Everybody uses the "rock nobody knows." More than 50,000 tons of "land plaster" — powdered raw gypsum — are used every year in the peanut belt in southern Virginia, the Carolinas, and Georgia, to improve the quality of the nuts. Ground gypsum is used in paints, and is also added to rubber products to make them hard and durable. On Hollywood movie sets, piled into heaps or drifting on the wind caused by wind machines, powdered gypsum gives a perfect imitation of snow. Most of the spectacular movie sets, too, are formed from gypsum plaster. At the other end of the glamor scale, gypsum is mixed with manure to make mushroom beds.

But by far the biggest portion of the gypsum rock used in this country goes into wallboard and lath for our homes. These gypsum "boards" are made by sandwiching a core of wet plaster between two sheets of heavy paper. When the core sets and dries out, the sandwich becomes a strong, rigid building material. Because of gypsum's water crystallization, gypsum "board" is also highly valued as an excellent fireproofing material.

You see, a block of molded gypsum is something like a block of ice. When a fire is placed on one side of a cake of ice, the other side stays cool until the entire block has melted. In much the same way, gypsum wall plaster cannot be destroyed until all the water has been driven out of it, and as long as the water of crystallization remains, the wall temperature cannot rise above the temperature of boiling water.

More than five billion feet of gypsum wallboard are manufactured each year in our country alone. This is enough to make a pathway four feet wide from the earth to the moon, or to build a wall 38 feet high all the way around the Earth at the Equator!

Yet, for all its many-fold uses, gypsum still remains the "rock nobody knows," one of our indispensable but unsung mineral servants.

## Outer Distance

By DANIEL SMYTHE

Beyond the touch of earthly hands  
An island universe expands.  
The far establishments of space  
Move at a depth no man can trace.  
Above the tiny air's blue shell  
There is no sound or syllable,  
But only stabs of distant light  
Upon the interstellar night.  
I hurl my thought against those years,  
And dream of stranger atmospheres,  
The clusters, stellar families  
That may have full and unguessed seas  
Where powers remote from words and wars  
Build architecture of the stars.



Reminders of the settlement that was Flamingo, a spot with a history. The town, if such it could be called, became a ghost in a manner that the superintendent of Everglades National Park here describes.

## The Last of Flamingo

By DANIEL B. BEARD

**T**HE commercial fishing hamlet of Flamingo, strategically located at the terminus of Ingraham Highway in Everglades National Park, became a ghost town in June, 1951. All occupants had vacated the premises in accordance with a federal court order following declaration of taking for park purposes.

The full history of Flamingo will probably never be known. It must have been lurid in spots. Certainly the reputation of the area through the years tends to convey this impression. When the park was created, Flamingo was a commercial fishing base perched precariously on the edge of Florida Bay. Its stilted houses, fish houses, and piers were built helter-skelter, well above high tide and hopefully beyond the reach of hurricane waters. Most of the inhabitants did not own any land. A few were squatters; but the main population, which fluctuated according to season, was made up of commercial fishermen who worked for the companies under an economic and social arrangement in many ways similar to tenant farming. Characteristically, the inhabitants went by nicknames: "Barrel-head," "Cootie," "Bull," "Preacher," "Sweet Tater," "Honest John," "Slim," "Boob," "Jolly Cholly," "Mutt House," "Dollar Bill," "Uncle Steve," "Blue Heron Brown," and a few that had better not be noted here.

It has been said that Flamingo once boasted of a school and a post office. Louis Loudon was the postmaster. Sugar cane (from which an alcoholic drink called "aguadent" was made) tomatoes, peppers, and

other produce was raised on the fertile, frost-free Flamingo flats. Lime groves were planted there. The produce was shipped by sailboat to Key West. Unwise drainage operations followed by hurricanes put an end to this economy. Plume-hunting was once a big business and plume-hunter Smith shot and killed his Flamingo neighbor, Bradley, who was employed by the Florida Audubon Society. During the prohibition era, Flamingoites began driving expensive cars down the streets of Homestead. After repeal, the community slipped back into a commercial fishing base. The terrible Labor Day hurricane of 1935 washed practically the whole town away, but few of the weather-wise inhabitants were lost. The Irwins clung to mangrove trees near Bear Lake. The Roberts' clan waded out through chin-deep water, and Bill Ganbee's boy was swept away from his father's arms and drowned, en route. Several almost perished after a wild night in the hold of a fish barge.

During World War II, the fish trucks from Flamingo ground through the deep mud to bring large catches of mullet, trout, snapper, and redfish to the inflated markets; but Coast Guard regulations more or less kept the fishermen in port at night. A large load of sugar (perhaps many) is reputed to have been carried out with the fish.

After the war, Everglades National Park was created. Some at Flamingo turned to entertaining the increasing tourist traffic in various ways. Park Rangers and

Flamingoites had several minor skirmishes over alligators, "eatin'-size" white ibis, loggerhead turtles, and other "legitimate" attempts to supplement a diet of grits and fish, or add a few dollars from 'gator hides to the kitty. A large turtle named after the park superintendent was gleefully butchered and consumed amidst the masses of mosquitoes, which were ignored because of liberal, internal applications of the finest products of Milwaukee.

The post-war economy of Flamingo — commercial fishing and sports fishermen — was rudely interrupted by the 1948 hurricane which sent some of the town slithering across the flats into the mangroves. More insidiously the drag seines that began to be used generally throughout Florida Bay fishing grounds decreased the catch of fish by Flamingo people using their less expensive, traditional gill nets. Always flexible to new methods, the people of Flamingo began to employ drag seines themselves and turned to hauling out live shrimp for sports fishermen who could get good catches, in spite of dwindling supply, with this sure-fire bait. Park special regulations put an end to the drag seines after Florida Bay was transferred to the park from the Fish and Wildlife Service.

The economic pattern of Flamingo was undergoing change when declaration of taking was invoked by the government to obtain title to all remaining private lands in the park. A court order told former land owners to evacuate the premises by early February of 1951. Appeal was made and the order was extended to June 1, 1951. The deadline approached, with hope that somehow it would not happen. A last minute appeal was denied.

Early in June, Chief Ranger Semingsen and his assistants began putting the pressure on Flamingo. The House Fish Company was out — lock, stock, and barrel. With money obtained from the court, they had moved to the west coast near Marco. Roberts Fish Company had done nothing. Here and there throughout Flamingo commercial fishermen remained. Some were frantically building house boats. One was constructing



Flamingo's waterfront still bears testimony to the town's busy fishing past.

a run boat to carry fish from the fishing grounds to the Florida Keys. Finally, Attorney Ball of the Department of Justice wrote letters to the last inhabitants (only one of whom had owned any land) mentioning that contempt of court action might be necessary. The last stragglers left. The Service issued net rack permits for Joe Kemp Key, and Flamingo became a ghost town of dilapidated shacks, filth, and rusting iron. Off Joe Kemp Key a flotilla of craft defying all description lay anchored.

Joe Douthert, "Boob" Weeks, and Bill Ganbees had a little too much of the modern equivalent of "aguardent" and decided to rip down the park's sign and gate in a last act of defiance. U. S. Attorney Duhaime has subpoenaed them to come to Miami for a talk, but no formal action was lodged against them. This was the only "incident," in the final passing of Flamingo.

## The Purple Martins Are Gone

By SUE WYATT-SEMPLE

The purple martins are gone away  
To warmer climes. Some other day —  
Another spring — they will return,  
With budding leaf and sprouting fern.  
Sparrows have taken over. They hold  
The martins' fort, spunky and bold!  
We miss the martins' noisy twitter;  
The vacancy seems cold and bitter  
To lonely hearts. We like to see  
Their graceful wings; their liberty

And their delight, in skimming over  
Rolling meadows, fresh with clover,  
Or surfaces of ponds; then rising  
With the wind, swift and surprising.  
Sweeping downward with the speed  
Of rockets, as they fly and feed.  
I know not why I have this thought  
Of battles won, and battles fought;  
And ask the questions: What? and When?  
Before your spring-return again.



# "Flower" Imprint of the Past

By ARTHUR R. THOMPSON

ONE HUNDRED million years ago the warm waters of an inland sea lapped upon a sandy beach near where Great Falls, Montana, is now located. Only a few years ago Mr. and Mrs. Joseph L. Jost were on a fossil-hunting expedition northeast of Great Falls, when they noticed a slab of sandstone containing a number of peculiar imprints. Mr. Jost collected a specimen. While examining the collection of fossils he has at his Hilger, Montana, home, I picked up this piece. The print looks as though someone had gently pressed a flower into soft sand. The outline of the "petals" is quite plain, and there is even the tiny hole in the center that would be made by the pistil.

With Mr. Jost's permission, I added it to some fossils I was sending to the U. S. National Museum in Washington for identification. The answer came back that the imprint was probably made by some kind of jellyfish. We searched among the pictures in the jellyfish "family album" and finally found the animal that appears to have made the imprint. Using the feminine gender, her name was *Glossocodon*.

This jellyfish consisted chiefly of an umbrella-like top, a few long slender tentacles and a long process with a flower-like formation at its extremity. By flexing its long manubrium, or proboscis, *Glossocodon* was able to travel on the bottom of the sea in search of food. In this manner the "flower" imprint was made, the small depression in the center being made by the little prong of a tongue.

In the nature of things, few of these imprints could ever be preserved. The action of the water would



soon erase all trace of them. The survival of one in a million would be a liberal estimate. Only by an early fortuitous deposition of some sediment other than sand, so as to form a line of cleavage, could they be preserved. A rain of volcanic ash, or a sudden storm that would bring in a layer of shaley sediment would suffice to do this.

As the ages passed, and formation was added to formation, the sand was turned to sandstone. Later the land was raised. Then came an erosional interval and the formations were washed away. Finally the last little wafer of sediment was washed away and the flower imprint was exposed for a brief period to man's gaze.

## Thoughts from the Backwoods

By OSCAR OSTLUND

THE Dawn is like an idea, incomparable, pouring its light into forms on the earth. Does any one of them exist without its correspondent meaning on the plane of thought?

\* \* \*

The reality of any particle of beauty in Nature takes shape when I see it in combination with the idea of God. The detached letter of the alphabet, which seems meaningless and dull to the beginner in school, becomes a thing of life in the makeup of the word, which, in combination with other words in the sentence, expresses a thought.

\* \* \*

Man is meaningless without God. God is meaning-

less without man. The behavior or energy in Nature, the line of its primal logic, points to some central hub of polarity in the operation of forces in which we live and think. This means that opposites complement each other in the atom, in the galaxy, in the dynamics of free thought.

\* \* \*

WHEN you are moved by the spectacle of daybreak, or by any beautiful thing in Nature, what is the primary impulse of your inspiration? What is uppermost in your thought; in your feelings? Is it not gratitude in living and for living?

\* \* \*

Gratitude is the hallmark of the humble man. He is

pliable in mind and spirit. He is the debonair personality for whom all the possibilities of life exist. The mood of thankfulness, the mood of his joy, through identification with things outside of his own ego-self — this is the link that harmoniously joins the small local area of his personal living with the Universal.

Ingratitude, conversely, signifies separation from Nature, separation from the Divine. In our own time how many of our fellow beings appear to be afflicted with ungratefulness, complaining; insensitive to individual responsibility, to individual opportunity. And so we see the lines of human relationships getting more and more entangled, chaotic. We see our civilization, caught in the vortex of hate and greed, plunging toward catastrophe. In the face of this outlook it is heartening

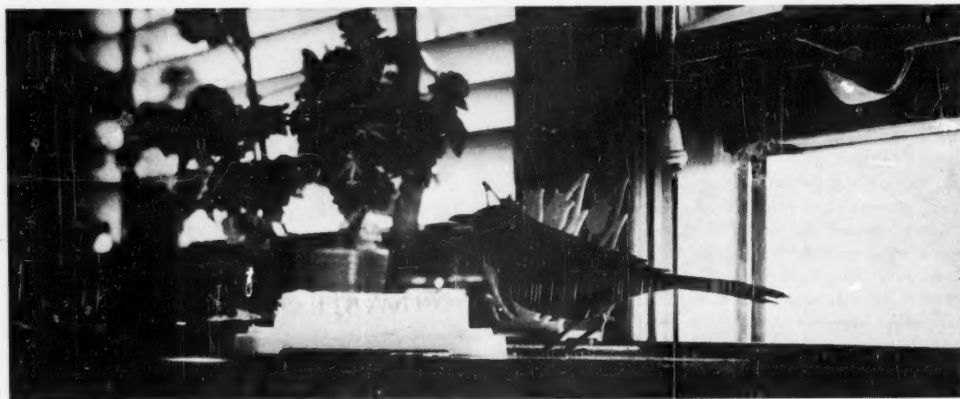
to contemplate God as the power and the source of a basic social coherence by which the precious fragments of humanity in all lands are being held together.

\* \* \*

**O**H, to be aware now, to be reminded by the Scriptures and by the records of evolution that "pride goeth before destruction."

Charles Schuckert tells us that the extravagant development of animal limbs shows up in the record of the rocks to be a bluff; the exhibitionism of a species on the way out. The appearance of physical bigness in any form of life is prophetic of its doom.

The geological point of view accords with St. Paul who says: "God hath chosen the weak things of this world to confound the things that are mighty."



PHOTOGRAPH BY NORRIS COLLINS

"Buster," the mockingbird, comes in for his handout of butter. One day he was detained for banding, and, although he seemed to resent this, he was back for his butter within the hour.

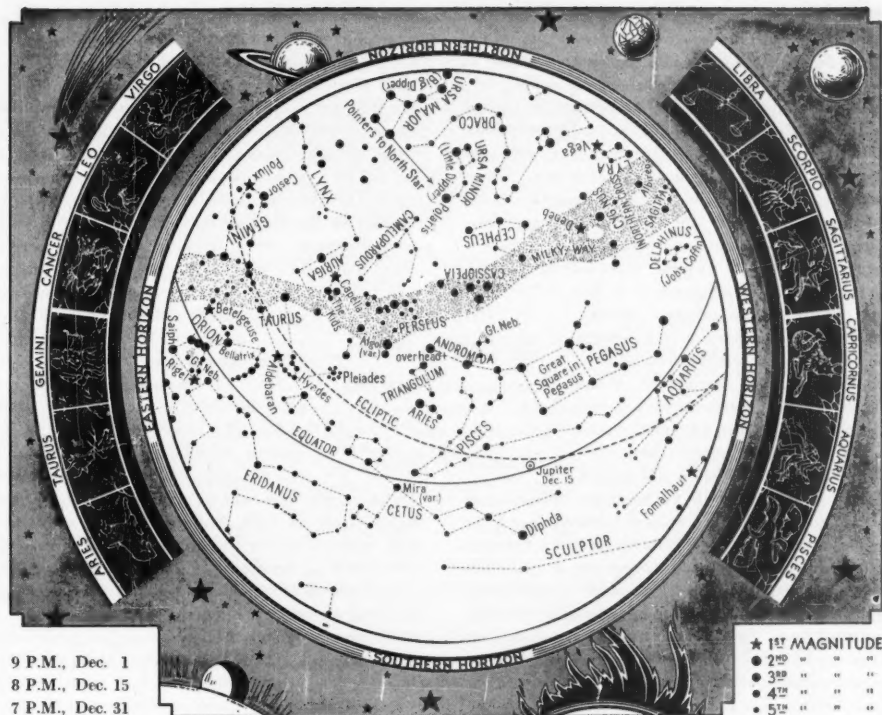
## "Buster" Is Banded

By VERA ALLEN NEWBY

**Y**OU would have thought we were cutting off both his legs instead of braceleting one in finest aluminum. It was the bird's fondness for butter that led to this decoration. I placed his butter dish at the far end of the room, then stood nonchalantly by the window as he hopped in and began searching for the food — a little game we play about every thirty minutes. When he had found it and was busily eating, I closed the window and the visitor was in custody. With the bracelet properly in place I put him out, fearing he might not come into my parlor again after such indignity. But before the hour was up he was ready for more butter, regardless of the consequences.

To go back a bit, the first of this year a very dirty mockingbird took over our back yard territory, just previously vacated by a former pet mocker who had become a cat's midnight snack. We named this one

"Buster," and it appeared he would "bust" himself, as his fondness for butter, crackling bread and pineapple seemed out of all proportion to his capacity. One very cold day, when he was eating from the sill and looking in the house, I sensed that he wanted to come in. I opened the window and in he hopped, made a complete tour of the room, warmed up on a lamp shade, and finally made his exit. So I moved his food inside, and in about twenty minutes he came to the window and called. I let him in, and he has kept a regular schedule ever since. When he first came in, I fed him from a drop-leaf table near the window, but now he may find his butter anywhere, and his bright eyes are not long detecting the hiding place. When I am gone for several hours, he meets the car and dances about excitedly, and the minute I get in the house there he is at the window, waiting.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then, below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

## The Splendors of Orion

By ISABEL M. LEWIS

**E**ARLY in December the magnificent constellation of Orion, The Warrior, lies across the meridian, high in the southern sky at midnight. It is then visible from sunset to sunrise. From the time when it rises, late in the evening in November, until it disappears, in the evening twilight in the west in May, it is one of the most readily recognized configurations in the evening sky. Orion cannot be seen in the evening hours in late spring, summer, or early fall.

The huge quadrilateral that outlines the body of this mighty mythological hero has in its northeastern corner the irregularly variable, red, giant star, Betelgeuze, an Arabic name meaning arm-pit. It marks the right shoulder of Orion. Diagonally opposite, in the left foot, is Rigel, the bluish-white supergiant star, an excessively hot helium star. In the southeast corner of the quadrilateral and marking the right knee of Orion

is the second magnitude star, Saiph, also one of the extremely hot helium stars. Bellatrix, The Amazon, is the star in the northwest corner of this enormous figure. Another of the type B, or helium, stars it is brighter than the standard second magnitude star. It is in the left shoulder of Orion. The long line of faint stars curving upward from the southwest to the northwest of Bellatrix are supposed to outline the uplifted left arm of Orion over which is thrown a lion's skin.

The head of Orion is marked by a group of three faint stars, midway and several degrees north of a line connecting Betelgeuze and Bellatrix. The faint line of stars that extends in a northwestward direction from Betelgeuze represents the uplifted club with which he faces the charging Bull, Taurus, to the northwest of Orion. The end of this club lies near the two stars that mark the tips of the horns of Taurus, whose fiery

red eye is the first magnitude star Aldebaran. In addition to the four brilliant stars that outline the form of this huge figure is the other most distinctive feature of this constellation, the three stars evenly spaced in a straight line midway of the line connecting Betelgeuze and Rigel, which form the Belt of Orion. A line passed through these three stars and extended toward the southeast points to the brightest of all the stars, Sirius, in the constellation of Canis Major. From southeast to northwest the three stars in the Belt are Zeta, Epsilon and Delta. The first two are exactly equal in brightness and slightly brighter than first magnitude. Delta is of about  $2\frac{1}{2}$  magnitude. It lies almost exactly on the celestial equator. From its central position on the equator it follows that Orion can be seen all over the world from the south pole to the north pole. Within ten degrees of the south pole the northern half of the constellation does not appear completely above the northern horizon, and within ten degrees of the north pole the southern half does not rise completely above the southern horizon; but from 80 degrees south to 80 degrees north latitudes the constellation is completely above the horizon as it crosses the meridian, and visible in all lands, at some hour of the night except when too close to the sun to be seen.

Depended from the Belt of Orion is the Sword of Orion marked by three faint stars, the farthest south of which is the third magnitude star Iota. Directly above this star, visible as a hazy patch of light without the aid of a telescope, is the finest object of its kind in the heavens, The Great Orion Nebula. It is seen visually at its best in a small  $2\frac{1}{2}$ - or 3-inch telescope. Embedded in the center of this great gaseous nebula is the star Theta Orionis, a star that consists of six individual components. Four of these form a configuration known as The Trapezium. It is seen through a telescope to be surrounded by a vast, luminous, greenish nebulosity. This nebula is the brightest of all the great diffuse gaseous nebulas. They are also called galactic nebulas because they belong to our own Galaxy or Milky Way system of stars. Similar formations undoubtedly exist in the great extra-galactic systems, which consist of systems of stars great in number, independent of and at very great distances, generally millions of light years, from our own galaxy.

The portion of the Great Nebula in Orion that appears in photographs taken with powerful telescopes of the region surrounding the star Theta, the central star of the three brightest in the Sword of Orion, has an extent of about 16 light years. The Great Nebula itself is at a distance of a 1000 light years or more. In all its great extensions and ramifications, it involves most of the constellation of Orion. All the excessively hot, bluish-white, helium stars in this constellation, often spoken of as "The Orion Stars," are intimately associated with the Great Nebula in Orion and are the source of the fluorescent light with which it shines. The

density of the gases of which the nebula consists is less than that of the best vacuum that can be formed in the laboratory. In the vicinity of excessively hot stars such gases become fluorescent, excited to glow with this nebular light by the high frequency radiations emanating from these stars. Bright lines in the spectrum are characteristic of fluorescent nebulas. They are mostly lines of hydrogen, helium, nitrogen, and oxygen. The greenish tinge that is so conspicuous in the vicinity of the multiple star, Theta, is due to doubly-ionized oxygen. Neon, which is abundantly present in Rigel and others of these excessively hot stars, is also

present in this and other gaseous nebulas but glows not with the red of the familiar neon signs but with the violet light of the ionized neon atoms.

Most of the excessively hot B-type stars in Orion are double or multiple stars. The supergiant star, Rigel, has a bluish companion of 7th magnitude which can be seen easily in a small telescope.

Theta, as we have said, is a sextuple star. The star, Sigma, close to Zeta, the star farthest south in the Belt, consists of four physically connected stars. Iota, lowest star in the Sword is visible in small telescopes as a double star. The two stars, Zeta and Delta, in the Belt of Orion are double stars also. There is a third magnitude star, Eta, a few degrees southwest of the stars in the Belt, that has a companion star. Many if not all of these extremely hot stars contribute through their high frequency radiations to the fluorescent glow of the portions of the Great Nebula that lie near them.

The red supergiant star, Betelgeuze, is not a true member of the physically associated group of stars that extends over nearly all of the constellation of Orion. Most of the brightest Orion stars of type B are between 500 and 600 light years distant. Betelgeuze is an M-type, irregularly variable star that is at a distance of about 270 light years from the earth. The brightness of this star fluctuates as much as a whole magnitude, or  $2\frac{1}{2}$  times, in brightness. The main fluctuation has a period of about six years. Superposed upon this main fluctuation there is a semi-regular variation in a period of between 150 and 300 days. The total light change is from 1.2 magnitude, which is that of Aldebaran approximately, to 0.2, which is that of Capella. It will be interesting to compare the changes in brightness of Betelgeuze with the unchanging brightness of these two stars, both of which are not far from Betelgeuze, as can be seen by referring to the star chart for December. Also as a standard for comparison one may use Rigel. The magnitude of this star is constant at 0.3, only a tenth of a magnitude fainter than Capella, an amount not noticeable without precise measurements.

The cause of the light variations of Betelgeuze are believed to be the result of an irregular contraction and expansion in the

(Continued on page 552)

## Skystuff

By RAY ROMINE

Softly settling snowflakes  
Are pointed icy quips  
Coined and then discarded  
By happy angel lips.



## The World's Pheasants

*The Pheasants of the World.* By Jean Delacour. New York. 1951. Charles Scribner's Sons. 347 pages. Illustrated by J. C. Harrison. \$35.00.

Until now William Beebe's *A Monograph of the Pheasants* has stood as the authoritative work on these birds. However, since the publication of this earlier volume, between 1918 and 1922, many new discoveries have been made. Thus ornithologists, breeders and sportsman felt a need for a new work, and Mr. Delacour has certainly met that need in this beautiful volume. There are sixteen color plates and sixteen plates in monochrome. Publication of this book crowns a half-century of research by the author concerning these birds.

## Controlling Weeds

*Principles of Weed Control.* By Gilbert H. Ahlgren, Glenn C. Klingman and Dale E. Wolf. New York. 1951. John Wiley and Sons. 368 pages. Illustrated. \$5.50.

The science of controlling weeds has been a fast-moving field, both in research and application. In this book three outstanding men in the study of weed control bring together the facts as they are now known and contribute an important guide and text.

## Spiders

*The Life of a Spider.* By John Crompton. Boston. 1951. Houghton Mifflin Company. 254 pages. \$3.00.

The lives of spiders have always fascinated this author-naturalist, and he has a rare ability to translate his studies of spiders into an interesting and informative story of their often adventurous and exciting lives.

## Molds and Man

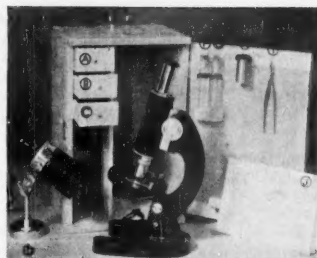
*The Molds and Man.* By Clyde M. Christensen. Minneapolis. 1951. University of Minnesota Press. 244 pages. \$4.00.

Subtitled "An Introduction to the Fungi," this book, at first glance, might be thought to be merely a textbook for the student beginning the study of mycology. It is that, to be sure, but actually it is a book that will be enjoyed by any layman interested in the fungi and their impact upon the lives of man.

## Insects

*Insect Natural History.* By A. D. Imms. Philadelphia. 1951. The Blakiston Company. 317 pages. Illustrated in color and black and white. \$5.00.

This book is directed at a lay audience of those interested in insects, thus keeping at a minimum unfamiliar terms and anatomical and classification details. Yet it is an excellent text for beginners in the study of entomology. The text is interestingly written and the pictures, particularly those in color, splendid.



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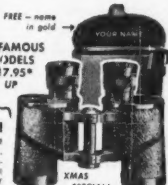
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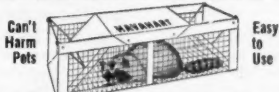
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# The School Page

By E. LAURENCE PALMER

Professor of Nature and Science Education, Cornell University, and Director of Nature Education, The American Nature Association.

## LET'S NOT PUTWUDITO

ACCORDING to my diary, two years prior to the day this was written, I sat in the master bedroom of a baronial estate in socialist New Zealand. In front of the house were acres of blooming daffodils dancing in the breeze. In a sick-bed beside me sat an old man who loved to watch flocks of school children coming through the fields with great armfuls of his flowers. In fact, he asked whole schools to come to his place to pick his flowers just because he loved to see children love beauty.

A maid came into the room to attend to the "master" and as she left, he said to her, "Putwudito." After she had left and closed the door, my curiosity got the better of me. Risking an impertinence, I asked the gentleman what he meant when he had spoken to his servant. In reply, he asked me what she had done. I said that she had left and closed the door. He then advised me that that is what he had told her to do. "Putwudito" meant "Put wood in the hole," which, translated, my friends, means "close the door." For two years I have mullied over that word for possible use in the title of a school page, and here it is.

Without half thinking, I can name a half-dozen college professors in natural history who gained their initial degrees in engineering to satisfy the ambitions of their families. I can do almost the same for the law. Then, when these now eminent gentlemen had attained reasonable prominence, they began to live and went back and did the things they really wanted to do. They entered the doors that had always been wide open to them, but which they had been advised to ignore.

The son of a colleague on the university staff for years showed a genuine interest and real ability in the natural history field. This year he is graduating with a degree in chemistry, but he tells me that when he takes over the helm of his ship, he is going to become a naturalist, in spite of the fact that his father mistakenly thinks the field has no practical future.

Yesterday, a thirty-two-year old man who is just getting a master's degree at the University of Massachusetts came into my office during my vacation period for professional advice. His father was a famous lawyer and in keeping with the wishes of the old gentleman, the son has a law degree. A year ago, the father died, leaving the boy an estate sufficiently large to finance two more years in college. Had the old gentleman lived a year longer, there is every reason to believe that, before this appears in print, he would have been a proud grandfather. The young man was faced with the dilemma of what to do, go on with life as a mediocre lawyer, exploring the door the father opened wide for him, or sacrifice it all, together with some security for his own family, and enter a new field where he feels he could really live. Let me ask you what can I do to advise a thirty-two-year-old expectant father, whom I have never seen for more than 30 minutes, to do in a case of this sort?

All I can say is that I have never regretted rejecting two opportunities that I could have taken and which might have given me some standing as a research botanist in the field of seed analysis, and said "no" two other times when I was offered professorial rank at Teachers College, Columbia, where I should have had to live or try to live in a city. I closed those doors that were open to me. In fact, I slammed some of them. I have had such a good time professionally for forty years that I now find it difficult to enter other doors that are open to me, doors that open into corridors that I can explore years after the university doors will be closed to me in a short five years.

I still want to explore, and I have every reason to believe that other human beings have the same desire. I do not believe I have the right to go around closing doors that open voluntarily to others. I am afraid many teachers and many parents consider it their duty to close doors rather than to open them. I see no criticism in opening every door in the neighborhood of a developing human being. I think that that is one of the obligations of a teacher. Maybe we can even enter a few doors with the students and do a little exploring with them, but to close a door, to put wood in the hole, to "putwudito" is another thing, a responsibility I, for one, cannot assume without reservations.

I once knew a guidance expert who advised a high school boy who was able with figures to become a public accountant. The fact that the boy had one bad eye was not given any consideration. It is fortunate that he did not follow the advice of the guidance expert because within a year he lost the good eye in an accident. It seemed to me at the time that the guidance counsellor should have pointed out the risk that went in preparing for a profession that was dependent largely on the ability to see, particularly when he was advising a boy whose whole professional future depended on what might happen to a certain square-inch of his body. I think that the counsellor might well have closed that door, but he based his advice solely on grades the student had made and not on what a casual interview would have disclosed.

For more than twenty years, I have run weekly radio programs in which I work directly with children along Nature lines. During those years, I think I have made many friends with those youngsters. One of those boys with whom I worked fifteen or twenty years ago entered a professional field on the advice of his parents. He saw military service in the Pacific and through that, got GI assistance to continue his education. A few months ago, a young man in his early thirties, with a grin that I had not seen in a decade or more, came into my office for advice. He had always wanted to do the things he had seen me doing years ago. In spite of a weak scholastic record, we gave him a knock-down, drag-out trial this summer and, for the first time in his life, he led his classes doing what he had always wanted to do. Frankly, I have no worry whatever for his future, and I am willing to bet that that infectious grin of his will remain there for a long while and will find fertile soil amid the freckles of many other youngsters in the next few decades. I am glad that I opened that door years ago, and even happier that, when I opened it again a couple of decades later, he found the outlook good.

I rather think that one of the responsibilities of teachers is to go about with students opening all sorts of doors. Of course, teachers who have never explored more than a single opportunity themselves may not be too helpful, but at least they should not "putwudito" to any youngster who shows ability and verve to enter any door that offers an honest opportunity for self-expression. The teacher who is frightened of snakes should read Dallas Lore Sharp's *Five Days and an Education* and find how one teacher opened a door to a boy, even though she herself was scared almost out of her wits at what might lie behind it. Years later, Sharp wrote of the experience he had when he brought to that teacher in her class a live king snake. He said: "For suppose she had been different, ordinary, and angered, as well she might have been, had me ordered from the room and had me expelled from school? I richly deserved it. But teaching is not to dismiss. It is to discern — to snatch a snake as a band of steel to bind a boy to his books or, winging the horrid creature, give him as Pegasus for the boy to ride." Those of us who, years later, found so much inspiration from the writings of that boy have every reason to bless that teacher who did not "putwudito" for that youngster.

Liberty Hyde Bailey, now in his middle nineties, still praises his elementary school teacher, who kept indefinitely opening doors for her prize pupil, doors that she herself had never opened, but behind which she must have recognized there was something that would interest this youngster to whose guidance she had the opportunity to contribute. According to Bailey, one of the doors might well have been Latin. She opened the door, explored a bit and while the pupil never again studied the

language formally, he still uses it freely in his everyday life. Other doors opened by this teacher were labelled botany, entomology, geology and literature, behind many of which the teacher had herself had no experience. What a calamity it would have been had she written in chalk across each of these doors "keep it closed," or "putwudito."

Why not spend your Christmas vacation at the meetings of the American Nature Study Society and of the National Association of Biology Teachers in Philadelphia? Many doors might be opened for you there. Maybe we will be seeing you there. I hope so.

### Attracting Birds

*Beginner's Guide to Attracting Birds.* By Leon Augustus Hausman. New York. 1951. G. P. Putnam's Sons. 127 pages. Illustrated by the author and Jackson Miles Abbott. \$2.00.

This is the latest addition to a growing library of books seeking to aid people to a knowledge of the techniques of attracting birds, and thus open up for them a fascinating field of interest. The text is concisely presented and includes a key to the identification of the more common species of birds that might be attracted.

### Briefly Noted

*Garden Spider.* By Mary Adrian. New York. 1951. Holiday House. 38 pages. Illustrated by Ralph Ray. \$2.00.

This is an attractive introduction for youngsters to the garden spider; one in this publishers "Easy Science" Series.

*200 Miles Up.* By J. Gordon Vaeth. New York. 1951. The Ronald Press Company. 207 pages. Illustrated. \$4.50.

A discussion of what man has learned and is learning about outer space and how to get there.

*Insect Resistance in Crop Plants.* By Reginald H. Painter. New York. 1951. The Macmillan Company. 520 pages. Illustrated.

This is an important specialized text in the fields of entomology and agriculture and one that suggests that insecticides are not the only means to insect control.

*Fire-Hunter.* By Jim Kjelgaard. New York. 1951. Holiday House. 217 pages. \$2.50.

This is a fiction story of the days when the saber-toothed tiger roamed the earth.

*Philosophy of Nature.* By Jacques Maritain. New York. 1951. Philosophical Library. 198 pages. \$3.00.

An essay on the philosophy of Nature and its relationship to the sciences, on one hand, and to metaphysics, on the other.

*Forestry in Farm Management.* By R. H. Westveld and Ralph H. Peck. New York. 1951. John Wiley and Sons. 340 pages. Illustrated. \$5.00.

This is a second and revised edition of this important text on farm forestry, standard for forestry schools and farmers seriously practicing forestry.

*Dictionary of the Arts.* By Martin L. Wolf. New York. 1951. Philosophical Library. 797 pages. \$10.00.

A dictionary of terms used in painting, sculpture, music, the theater, the dance, literature, architecture, archaeology, mythology, ceramics, costume and applied arts.

### Bulletins

"Adventures in 'Rockfish' Cookery" by Margaret R. Lunning and E. W. Harvey is Station Bulletin 501 of the Agricultural Experiment Station, Oregon State College, Corvallis, Oregon. . . "The Story of Pueblo Pottery" by H. M. Wormington and Arminta Neal is the second Museum Pictorial of the Denver Museum of Natural History. . . "Breeding Habits of Lake Trout in New York" by William F. Royce is Fishery Bulletin 59 of the U.S. Fish and Wildlife Service. Twenty cents from Superintendent of Documents, Washington 25, D.C. . . "Water We Use and Misuse" by Alison E. Aitchison is Conservation Bulletin No. 3 of Iowa State Teachers College, Cedar Falls, Iowa.

### Wirth Heads Park Service

Conrad L. Wirth becomes Director of the National Park Service upon the retirement on December 8 of Arthur E. Demaray, who then terminates a Federal Government career of forty-eight and one-half years. Hillory A. Tolson has been designated as senior assistant director, and Thomas J. Allen has been appointed assistant director. Mr. Wirth has been with the National Park Service since 1931, except for one year when he served with the United States Allied Council in Austria. A native of Hartford, Connecticut, he is a "natural-born" park man. His father was superintendent of Hartford parks before moving to Minneapolis to head the parks there for 28 years. Mr. Wirth's brother, Walter, heads the Pennsylvania State parks. Mr. Allen, with the service since 1920, comes to the Washington office from his post as regional director of Region One, with headquarters in Richmond, Virginia.

### Heads Redwoods League

Arthur E. Connick, a pioneer in the movement to save the redwoods, has been elected President of the Save-the-Redwoods League to fill the vacancy left by the death of Duncan McDuffie. Mr. Connick has been a director of the League since 1938 and vice-president since 1944.



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# Camera Trails

By  
EDNA HOFFMAN EVANS

**T**HE Christmas season is here once more. Again it is time to make out the annual list, to chew the pencil, to decide what we should get for whom and how much we should spend for it.

Despite the uncertainty of international relations, there is little in the camera world to suggest that times are not normal. By this I mean that no scarcities in the film and photography field loom up on the seable horizon. Last year, when I wrote about Christmas shopping, I did so with my fingers crossed. Remembering how scarce film and supplies were during World War II, I was a bit afraid to suggest what might or might not be available against the Korean background. As of now, however, the camera world seems little affected by international affairs. Thus, we can shop with full shelves and plentiful supplies to choose from.

As always, let us begin our list with the most important of all photographic supplies, namely, the camera.

Gift cameras tend to come from the lower priced field. Not many of us can afford to give the high priced supercameras that we would like. The fine lens, fast action, multiple purpose cameras are, in the main, beyond the scope of our pocketbooks, so far as gifts are concerned.

What kinds of cameras can we give and still have money left for other presents?

This year I predict that a great many of Eastman's new Brownie movie cameras will be found under Christmas trees. The company has put on an energetic advertising campaign, stressing the ease, versatility, and simplicity of the camera. Many a good still photographer began with a Brownie box camera. The Brownie's movie-taking brother also should be a good starting place. It has its limitations but it deserves definite consideration as we make out our Christmas shopping list.

In the still camera field, several new cameras or new models have been added. The list of availables is much too long to permit us to consider all of them. We will have to pick a few at random and then go on.

The 35mm camera is growing increasingly popular. Among those available are two European-made models imported by the Sterling-Howard Corporation, 561 East Tremont Avenue, New York 57, N.Y. First of these is the Opema camera. This model has a single-window range-finder view-finder focusing device, an f3.5 "C" coated Belar lens, shutter speeds from 1/25 to 1/500 sec, and an economy format type negative that makes possible as many as 42 exposures from the stand-

ard 36-exposure cartridge. Its price, which is fairly low in the better camera range, is \$59.50, tax included. The leather carrying case is \$6.50 extra.



The Praktika camera has a good lens and a flexible reflex focusing device.

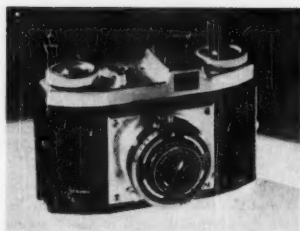
Second of the Sterling-Howard cameras is the Praktika Reflex, a single lens model whose focal plane shutter is capable of speeds from "bulb" and 1/2 second to 1/500 sec. It is equipped with an f3.5 "T" coated Zeiss Tessar lens. With built-in flash synchronization, the Praktika sells for \$84.50. Without the synchronization its price is \$69.50. Further information about both models can be obtained from Sterling-Howard.



The Elioflex is an Italian-made twin-lens camera that uses 120 film and takes 2 1/4 x 2 1/4 size pictures.

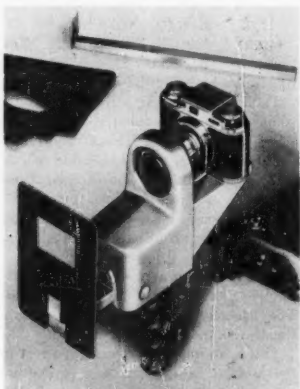
In the twin-lens field we might note the Italian made Elioflex camera that uses 120 roll film and takes twelve 2 1/4 x 2 1/4 exposures per roll. Its price is low — \$27.50 including tax. The importer is G. A. Buttafarri, 207 Fourth Avenue, New York 3, N.Y.

Penn Camera, 126 West 32nd Street, New York City, is distributor for the German-made Regula II, a 35mm camera with a coated Ennagon f3.5 lens. It is capable of speeds up to 1/300 sec, has an eye-level view finder, built-in self timer for delayed action shots, and flash synchronization. The Regula II is available from the Penn company via mail order. Its price is approximately \$32.50.



The Regula II is a German-made 35 mm camera.

This last camera is definitely out of the low price field but because of its adaptability to scientific photography, it interests me. The entire outfit includes the Bolsey B special close-up camera, a pistol grip mounting for a specially designed built-in strobo light, and a system of range frames. A detailed description of its operation would require entirely too much space. But for those interested in close-up scientific photography I suggest a closer investigation of the apparatus. Price for the complete unit is approximately \$250. Information can be obtained from the Bolsey Corporation of America, 118 East 25th Street, New York 10, N.Y.



This Bolsey B Camera, with a specially designed built-in strobo light and system of range frames is intended for use in close-up scientific photography.

It is no easy task to buy a camera for someone else. If you do have one on your Christmas list, do not be misled by shiny trimmings and gift wrappings. Do not buy something simply because it looks shiny and its price is cheap, or because it is supposed to be something "new." Look well at the old standbys bearing names that command respect in the camera field. And, one further word of advice. Buy your camera at a camera shop — do not pick one up in a hurry at a store that has laid in a few cheap, flashy models just to catch the Christmas trade.



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Bolsey's pocket-sized exposure guide makes a handy, inexpensive gift.

Getting back to less expensive gift possibilities, I would suggest a 25-cent additional purchase to accompany the simple camera buy. This is Eastman's recently prepared booklet of "Photo Tips for Simple Cameras." With a minimum of words and a maximum of photographic illustrations, the booklet is designed to help the snapshooter get the best possible results with his camera.

Another simple, inexpensive device (at 25 cents) is the Bolsey exposure guide. It consists of a pocket-sized plastic envelope and card. By means of numbers on the card and correlated windows in the envelope, readings for ten different kinds of film, a wide subject range under all reasonable natural light conditions, eight flash bulb types, and triangularly arranged photoflood set-ups are obtainable.

For those who prefer a three-dimensional picture, the battery-lighted Brumberger Stereo Viewer offers definite gift possibilities. The housing takes any standard sized 1-5/8 x 4 inch mounts. Less batteries, the viewer retails at \$9.95. For a complete catalog of stereo, slide, movie, and darkroom accessories, write to Brumberger Sales Corp., 34 Thirty-fourth Street, Brooklyn 32, N.Y.

At Christmas time the darkroom supply shelves offer countless gift possibilities. There are funnels, trays, tongs, safelights, timers, tanks, dryers, chemicals, and supplies of all sorts. But, since darkrooms tend to be rather small, crowded places at best, and because each one definitely reflects its owner's individual likes and dislikes, I hesitate to suggest the addition of too many gadgets.

One darkroom gift possibility not usually thought of would be the white, washable rayon gloves marketed by the Tenplus Company of Warren, Pa. Designed to enable darkroomers to handle films without leaving telltale finger marks, the gloves sell for \$1.98 per pair.

For the darkroomer who might like to try photomurals, Eastman has a new type Kodak Mural Paper R, single weight, that

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Because of the importance of the above message, this space has been contributed by

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can be creased or folded without damage. The new paper is somewhat faster and colder than Portrait Proof paper and slightly slower and warmer than Kodabromide. It will be available in contrasts 2 and 3, in sheets sized from 8 x 10 to 20 x 24 inches, as well as in rolls 42 x 100, 42 x 250, and 42 x 500. A package of the largest size, neatly wrapped, would certainly look interesting if found under the tree on Christmas morning.

The above are merely suggestions. When buying gifts for a darkroom-user, I heartily advise a little ingenious questioning beforehand. That makes it much easier to determine just what the particular individual needs and wants.



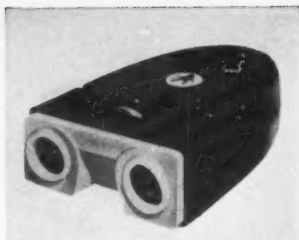
Eastman's new super-sized photographic paper comes in a box like this.

In the field of flash photography, Eastman has within recent months perfected for the market a new professional-level battery-condenser photoflash system. Trade name for it is the Kodak Ektalux. It is designed for professional, press, and advanced amateur needs and is available to fit a variety of cameras. Since the device is a marked departure from the typical flash apparatus, its possibilities cannot be covered in a few words.

Briefly, however, the battery-capacitor system uses one or two 22½-volt batteries in place of the 1½-volt flash-light cells usually used to set off the flash bulb. It makes possible a more consistent synchronization, has greater flexibility, and can be used with as many as seven lamps. For portability, there is a saw-grip on the light magnesium casing.

This Ektalux device is not for the beginner, of course. But it is something new in flash photography and some of its principles probably will filter down into the snapshotter field before long. Many of the refinements once exclusive to high priced cameras are now within the reach of everyone.

So, as our 1951 Christmas camera shopping tour comes to an end, we can drop into an easy chair, kick off our shoes, and heave a tired but satisfied sigh. We have



This stereo viewer has a battery powered illuminating system.

seen a lot of interesting camera gadgets and have added considerably to our knowledge of and respect for photography.



The Kodak Ektalux flashholder has a light magnesium case and a saw grasp design that makes it easy to pick up and hold in any position.

Let us hope that we have not over-spent our budget or made any purchases that are too inappropriate. If you write to any of the manufacturers or dealers listed, be sure to mention "Camera Trails."

And now, while the old gentleman in the reindeer sleigh gallops by on his annual journey through the midnight air, may I be among the many to wish you, one and all,

A Very Merry Christmas!

## THE SPLENDORS OF ORION

(Continued from page 546)

star itself. Observations have been made of oscillations in the lines of the star's spectrum that would indicate that the diameter of the star increased 60 percent from the time when the light was at a minimum to the time when it was at a maximum. The diameter of Betelgeuze has been estimated to be 300 times that of the sun, but the extremes of measurement are 360 and 530 times that of the sun. The density of the matter of which this star is composed is estimated to be only one two-thousandth of the density of air at sea level. The density of Betelgeuze is at one extreme of the density

range of stars, and one of the white dwarfs whose density exceeds that of Betelgeuze by 20,000 million times is at the other. Red giants such as Betelgeuze contain the least stuff of which stars are made, per unit of volume, of all the different types of stars, and the white dwarfs the most. The density of the latter is estimated in tons per cubic inch!

Mercury will be in inferior conjunction with the sun on December 16. It may be seen in the morning sky, however, by the end of the month, when it will be low in the southeast before sunrise. Venus is now a morning star, also in the southeast before sunrise and very conspicuous. Mars rises soon after midnight. It is in the constellation of Virgo and not far west of Spica. Saturn also is in Virgo this month west of Spica, and Mars, now moving in direct motion eastward, is in conjunction with Saturn on December 19, and passes less than a degree to the south of it. Mars can be distinguished from Saturn at this time by the fact that Mars is now fainter than Saturn, which at this time is exactly as bright as a star of first magnitude. Mars is also reddish in color and Saturn pale yellow.

Jupiter is still in Pisces. It is a brilliant object in the southeastern sky at sunset, and sets soon after midnight.

## Virginia Birds

*Birdlife of Virginia.* By Joseph J. Shomon. Richmond, Va. 1951. Commission of Game and Inland Fisheries. 88 pages. Illustrated. Twenty-five cents.

This booklet is prepared by the chief of the Education Division of Virginia's Commission of Game and Inland Fisheries in response to a need for a bird bulletin for the Virginia schools. The author has turned out a practical and instructive work that will be vastly helpful in introducing the State's young people to bird life and its value, and in aiding teachers. This is also a "must" for Boy Scouts, if we may judge from our experiences as a bird study merit badge examiner.

## Flora of Arizona

*Arizona Flora.* By Thomas H. Kearney, Robert H. Peebles, and collaborators. Berkeley, California. 1951. University of California Press. 1032 pages. Illustrated. \$7.50.

Arizona is an amazing meeting place for nearly every life form found among North American flowering plants. The life zones existing within the borders of the State range, by virtue of extremes in altitude, from the Arctic-Alpine to the Subtropical. Therefore this important book covers a wide variety of flowering plants, ferns and fern allies growing wild in Arizona. Some 3370 species are included in this volume, together with their identification, keys to which are provided. This is a monumental and extremely valuable work.

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# UNDER THE MICROSCOPE

By JULIAN D.  
CORRINGTON

## PHASE-CONTRAST MICROSCOPY

### 3. Applications

IN THE two preceding issues we have described the phase-contrast principle, a new development in microscope methods which takes advantage of the phenomenon of interference of light waves that are out of phase. By means of coated discs the optical paths of light rays through various parts of the specimen detail are either accelerated or retarded so as to accentuate small differences, and intensities are so controlled that these differences are readily observed. Thus material that seems homogeneous or nearly transparent when viewed in ordinary brightfield microscopy may be revealed as containing much intricate detail, seen in varying degrees of light and shade, when phase plates are employed. The chief elements used are known as A+ or bright contrast, looking a bit like darkfield; A- or dark contrast, like brightfield but darker; and B minus contrast. The first two are, in general, used with unstained, the last with stained material. The method is supplementary to and does not replace regulation brightfield microscopy.

Since the phase-contrast technique is new, it is likely that there will be further developments or at least improvements, as well as new applications. Yet a great deal has already been done in exploring the possibilities of "phase" — to use a shortened monicker. In biology and medicine the procedure is even now considered a noteworthy addition. As we have seen, there are limitations to all other methods of study; — for example, fixing and staining not only kills living material but may distort and introduce artifacts; intravital staining is sometimes difficult and affects only certain structures; darkfield and polarized light are useful only with particular specimens. Phase fills many of the gaps, often supplying new or additional information.

Living cells and tissues take top rank among phase subjects. Protozoa, such as the universally studied amoeba and paramoecium, stand out in sharp detail, showing nuclei, vacuoles, and such fine structures as flagella and cilia clearly without staining. Parasitic species, as *Endamoeba histolytica*, are found and observed more readily with phase; malarial sporozoites can be seen in fresh, unstained blood smears. Without using vital dyes, chondriosomes are visible in the fresh condition, as in onion epithelial cells. Cyclosis in *Elaeodea*, favorite demonstration in ele-

mentary biology, is much clearer than with non-phase optics.

Bacteria were, naturally enough, among the earliest of objects scrutinized under the new technique. They yield sharp boundaries, without diffraction, for purposes of measurement; bright contrast affords much greater ease and certainty in making counts; and such features as flagella or spores, usually requiring special and uncertain stains, may often be seen in the living cells. Live bacteria in tissues are spotted and identified. Spirochetes may be seen and determined without recourse to the tricky method of silver staining or else to darkfield — heretofore the sole procedures available. Rickettsia, yeasts, molds, and other fungi provide much plainer pictures, with better detail; Hofer and Richards even watched the destruction of *Rhizobium* by its bacteriophage under bright contrast. Plankton research will benefit through this new discovery.

Chromosome study is facilitated. Last month we published a photomicrograph of a fresh, unstained giant salivary chromosome of *Drosophila* made with brightfield, the diaphragm stopped down, and showing practically nothing. Alongside was the same subject under phase, displaying remarkable detail. Mitotic figures in living material have been observed, and this may prove a major contribution to biological teaching when the technique has been simplified. Blood study from many aspects — developmental, physiological, pathological — is greatly aided by phase, both as fresh smears and those supravitaly stained. In tissue culture work, as with chick embryos or cancer cells, phase presents greater detail, and undoubtedly much more will be heard from this method in future medical research.

With histological subjects, fine structure has been clarified. In addition to blood, epithelial cells have been much studied, some showing the Golgi apparatus in the living state. Connective tissue films show up a variety of cells and fibers far surpassing that seen with non-phase objectives. The new apparatus will demonstrate the myelin sheaths of medullated nerve fibers, the neurons themselves, and nerve endings, taking the place, in certain instances, of lengthy and advanced impregnation procedures. Phase optics frequently may be used in conjunction with vital staining and the Feulgen technique, and probably will be tried more and more with regulation stained slides, to observe parts that either do not stain, stain poorly, or do not differentiate.

However, not all of the utility of phase work is concerned with biological material. Geologists, mineralogists, chemists, and scientists working on applications in many industries, have found phase contrast extremely useful. Small differences in colorless minerals or thin sections of rocks are emphasized, either with ordinary or polarized light. Determination of the refractive index of chemicals and min-

eral crystals by the immersion method is rendered easier, quicker, more definite.

One of the problems in many industrial procedures is the determination of particle size. Another is particle density, or number per unit area. Minute particles, as in paints, waxes, films, or metallic alloys, may have to be measured and counted; bacteria, white corpuscles, fibers, crystals, droplets, and numberless other objects may require specific determination or enumeration on ruled slides. Sometimes it is the particle that is of positive value in the substance, as pigments in paints; sometimes it is an unwanted adulterant, as mold spores in canned tomatoes. The phase microscope has rendered all of this determinative and quantitative work easier and more accurate, often resolving what seems to be a single particle into a clump of smaller, countable particles. The emulsion droplets seen in mayonnaise or homogenized milk under the phase instrument are about one-quarter smaller than the smallest observed in brightfield work. Food and drug adulterants are detected to a degree heretofore unapproached.

Microscopic scratches on transparent surfaces, as glass plates, are revealed in far greater clarity by using phase; — indeed, they commonly may not be seen at all under brightfield. If an opaque surface is to be examined, as in metallography, replicas in such transparent media as cellulose or silica may be prepared and these studied instead of the original; this technique has also been applied recently to examination of surface cuticular scales of hairs and fur. Photomicrography with phase optics is no different than with non-phase; stereophotomicrographs present the added detail to best advantage.

This brief discussion by no means exhausts the list of applications of phase microscopy already undertaken, and no doubt we shall be reading of many more in the months to come, as phase takes its place to an increasing degree among other microscopic methods.

## SCIENCE SHOPS

### 3. Eimer & Amend — Fisher



THE role of the science shop in the development of science — research, manufacturing, and training — is well brought out in a recent issue of *The Laboratory*, house

organ of the world's largest supply house, the Fisher Scientific Company, of Pittsburgh. The entire issue (Vol. 20, No. 5) is devoted to a history of one of America's most celebrated firms, Eimer & Amend, of New York City, founded in 1851, bought by Fisher in 1940, and ceasing to exist as a separate institution upon attainment of its centennial in 1951. The 56-page booklet includes 68 halftones, forming a pictorial history of a century of progress in supplying the physical, chemical, and biological laboratory, in university and in-



dusty, with successive views of the building at Eighteenth Street and Third Avenue as the plant continued to expand. Portraits of their leading personnel are incorporated, as well as of famous scientists, illustrations of equipment items, excerpts from old catalogs and accounts, and interior views of their laboratories. There are also 40 zinc etchings, 35 of which are attractive thumbnail cuts serving as sectional headings.



The front cover pictures the original building, a reduced illustration of which appears here-with, while the rear cover shows the modern plant, known as the Eimer & Amend Division

of the Fisher Scientific Company, located at 635 Greenwich St., New York 14. The title of the single article in this issue is "Eimer & Amend, Armors of Science," and the text begins with a quotation from Thomas Carlyle — "Man is a tool-using animal. Nowhere do you find him without tools; without tools he is nothing, with tools he is all." Another quotation of equal aptness, this time from Henry Ward Beecher, forms the tailpiece — "A tool is but the extension of a man's hand, and a machine is but a complex tool. He that invents a machine augments the power of a man and the well-being of mankind."

Bernard Amend was born at Darmstadt, Germany, in 1821. This founder of the firm studied under the great Liebig at Giessen and there met the young American, Eben Horsford, who was widening his preparation for the position of first professor of chemistry in the newly founded Lawrence Scientific School at Harvard College. Horsford induced his friend to come to America and to Harvard, but Amend instead entered an apothecary's shop in New York in 1848. Next he was employed by Dr. Milnor, at the doctor's shop, 18th St. and 3d Ave., as pharmacist and, in 1851, with Louis Gail, a fellow classmate under Liebig, bought out the store and started the firm of Amend and Gail. The partner wished to be a consulting chemist, however, and since this aspect of the business did not develop, was glad to sell his share to Carl Eimer, another Darmstadter, who came over in 1853. Inasmuch as Eimer was slightly older and had brought a considerable financial contribution, as well as important connections with German manufacturing chemists, he became the senior partner. Amend remained as president for sixty years, from 1851 to 1911.

To its function as a local pharmacy, of high repute for thoroughness and precision, was now added the far broader service of an importing firm, so that within five years, in 1856, we observe a building three times the size of the original through additions both on the 18th St. and 3d Ave. sides, and bearing the sign, "Eimer

& Amend, Wholesale Druggists." Some adjoining stores were acquired in 1876. In 1886 an entirely new building, of very imposing facade, seven stories and a basement in height, of yellow brick and granite, was erected on the same site, and only ten years later this structure, "planned to meet all future needs," had to be considerably enlarged. Again in 1899 and in 1921 additions were erected that dwarfed the original. In 1942 the old site was finally abandoned, with the move to the much larger new plant on Greenwich St.

From its inception, Eimer & Amend maintained the largest inventory of materia medica anywhere to be found, and during its century of existence, the dispensing side of the business has handled over eight million original prescriptions, far and away a world's record. The new Eimer & Amend Apothecary continues this aspect of the firm at 49 East 34th Street. However, drugs were to become a minor factor of the entire E & A trade. Following the Civil War, when the firm supplied the Sanitary Commission and the Army with drugs and medical supplies, demands arose from two sources in this country for laboratory glassware. Colleges and universities were increasing in number and expanding their science offerings, and the opening up of the Western mines developed a need for analytical and assaying equipment. Thus when, in 1873, Eimer's nephew, August Eimer, then but 19, arrived from the homeland to join the firm, it was decided to send him back to Germany to make contacts with manufacturers. For this purpose he was armed with a letter of credit for thirty thousand dollars, a huge sum in those days. After a few months, young Eimer returned with the contracts: Schmidt & Haensch, polariscopes and other optical instruments; Carl Zeiss, microscopes; Sartorius, chemical balances; Royal Berlin and Royal Meissen potteries for chemical porcelains; Schleicher & Schull, filter papers, and so on through the list of chief German instrument and apparatus makers, as well as C. A. F. Kahlbaum, reagent chemicals.

All of these items came in duty free if consigned to educational institutions. Many were reshipped to other supply houses, Eimer & Amend acting as agents and jobbers. Glassblowers were added to the force, and gradually the company became identified with some of the important research projects and inventions of the dawn age of science. Charles Chandler, active in promoting chemical journals and the teaching of chemistry, was a close associate of Amend; Thomas A. Edison relied on the firm for bulbs for his incandescent lamp experiments as well as for a multitude of substances as possible filament material; Felix Frankfurter, later a great teacher of law and U. S. Supreme Court Justice, and Charles P. Steinmetz, electrical wizard, are said to have been employees of Eimer & Amend in their early days; Charles Dana, Washington Irving, Peter Cooper, Hamilton Fish, Cyrus Field, and many others whose names are illus-

trious, were regular customers; Thomas Willson came from Canada with ideas about aluminum production that eventually produced no aluminum but resulted in establishment of the great Union Carbide and Carbon Corporation. This made Eimer & Amend sole agents for acetylene at one time.

Electrical furnaces, developed during this abortive aluminum research, led to discoveries in steel alloying, particularly with chromium, and to furnaces running the gamut from small heaters used by dentists for gold and dental alloys to large industrial installations. Geissler tubes, a scientific curiosity that in our day are all about us in the form of neon signs and fluorescent lights, and Crookes tubes, which have led in our times to cathode ray oscillographs, radio, television, radar, and the electron microscope, were first imported and then manufactured by Eimer & Amend. X-ray tubes and Dewar flasks were made by E & A at the turn of the century, the latter giving rise to today's thermos bottles. Then they imported radium. August Eimer succeeded Bernard Amend as president, serving from 1911 to 1925. He died in 1941 in his 88th year. E. R. Squibb and Henry Ford were among customers frequently seen at the big concern.

The back cover of Eimer & Amend's price book for 1913 listed 23 foreign companies, almost all German, for which the American firm was sole agent. Besides those already mentioned, there were Dr. Gruebler's famous biological stains, Stender's reagent bottles, Gundelach's X-ray tubes, Jena glassware, Geryk pumps, and others, all soon to become shut off by advent of the First World War. Eimer & Amend was seriously affected, with the inevitable distrust of its German personnel and affiliations, but weathered the storm, proved its loyalty to America, and participated in the development of the new American chemical and apparatus industry fostered by the war. Business continually expanded. There were new researches to assist, as that of Van Slyke's blood-gas apparatus, Thomas Midgley's hunt for a suppressor of detonation in the internal combustion engine for General Motors, culminating in the selection and perfection of tetraethyl lead, as well as his work on freon as a refrigerant. The firm's plant at Edgewater, N. J., was established where chemicals from commercial sources are purified so as to bring them up to reagent standards.

We come now to the tale of how the tail wagged the dog. Back at the turn of the century, Hunt & Clapp operated a testing laboratory in Pittsburgh and arranged to carry a line of Eimer & Amend goods. In 1902 they sold this portion of their business to Chester G. Fisher, who proceeded to build up a strong laboratory supply business as the Scientific Materials Company, later the Fisher Scientific Company, located at 717 Forbes St., Pittsburgh 19. This organization prospered so well that in 1940 Fisher bought Eimer & Amend, but

continued the old name until the centennial year, 1951, when the New York firm ceased to exist, becoming the Eimer & Amend Division of Fisher. A branch house was established in Montreal, the Fisher Scientific Co., Ltd., 904 St. James St., then at St. Louis (3), 2109 Locust St., and most recently at Washington, 7722 Woodbury Drive, Silver Springs, Md. Fisher brought the manufacturing of equipment and apparatus into the picture, making the combine one of the strongest and most versatile companies in the world.

The present catalog of the Fisher Scientific Company is No. 90, issued in 1942, with a supplement added at the rear on tan paper, reprint of 1949, to include recent items. It is a beautifully printed and bound volume of 1030 pages, with thousands of illustrations. A textbook of this size and number of illustrations would easily cost the buyer \$25. Some 15,000 items are described, of which Fisher makes about 500. Over 85,000 copies of this expensive publication have been distributed.

At Fisher's one buys acid pumps and

alkalimeters, animal cages and asbestos gloves, asphalt viscosimeters and auto-clave-digesters, to mention just a few items in the letter A. Another catalog, 95-C, issue of 1946, consists of 280 pages of double-column listings of chemicals, averaging nearly 40 items per page, to a total many times the number that anyone other than a chemist would believe possible. Eimer & Amend were pioneers in establishing an American line of reagents and the first to print the full analysis on the label, under their "Tested Purity" trademark. Fisher uses the alchemical symbol, shown herewith, in many forms of advertising.

Fisher owns the largest and finest collection of paintings, engravings, and prints on the history of science, particularly featuring the alchemist. Reproductions of these frequently grace the cover of *The Laboratory*, Fisher house organ mailed five times a year to 120,000 customers. This 9 x 6 journal is mainly promotional but always includes historical or technical articles of interest to scientists. Items are not only described and priced, but

interesting notes on their development and photographs of their actual use are often added.

A recent issue of *Industrial Marketing* featured Fisher under the designation "Industrial Sears, Roebuck" because, unlike other big industrial plants, Fisher receives many hundreds of small orders each day rather than a few large contracts. The average order is for \$34 and a conveyor belt system for handling this volume of correspondence and paper work has been installed. Mailings from Fisher, often involving as many as 120,000 pieces, are handled by the Institute for the Blind in Pittsburgh, a social contribution of importance. Fisher keeps 38 salesmen on the road as a service to institutional customers. They take no orders, but call attention to new products, methods, and offer assistance in supply problems. Chester G. Fisher is still the active head, as Chairman of the Board, while his son, Aiken W. Fisher is president, James A. Fisher is veep in charge of sales and advertising, and Benjamin R. Fisher veep in charge of plant operations.

### THREE SCIENCE HISTORIES

Briefly and excellently written is *The Path of Science*, by C. E. Kenneth Mees, V.P. in charge of research, Eastman Kodak Company. The book grew out of a series of lectures at the University of California. A listing of chapter headings will explain Dr. Mees' plan of organization of subject matter: the interpretation of history, the helix of history, the method of science, the development of the scientific method, the growth of physical ideas, the growth of chemical ideas, the growth of biological ideas (by Dr. John R. Baker, Oxford), the production of scientific knowledge, applied science and industrial research, and the path of science. The central chapters give the facts of the historical development of the three chief sciences. Earlier discussion centers around classical and philosophical beliefs as to the meaning and trend of civilization, the impact of science and its method on civilization, how this method came into being, and the ever increasing acceleration of scientific progress. The later chapters describe the nature of modern scientific research; where, how, and by whom performed, stressing the role of government, university, foundation, industry, and other sponsors, and the attempts to apply the scientific method to the social sciences. The book is absorbingly interesting and stimulating for either scientist or layman. Pp. xii, 250; frontisp., figs. 6. John Wiley & Sons, Inc., 440 4th Ave., New York 16, 1947. \$3.00.

An anthology of famous scientific writ-

ings is another approach to comprehension of science history and its influence upon the general history of our times. Edited by Harlow Shapley, Samuel Rappaport, and Helen Wright, *A Treasury of Science* includes 76 pieces of scientific writing that run the gamut from Copernicus and Galileo to Jeans and Eddington, from Darwin and Huxley to Beebe and Hooton. You may read Edward Jenner's own account of his investigation of smallpox, or George W. Gray's story of war surgery or of brain storms. J. R. Oppenheimer and others write of atomic fission in the same book that contains Donald Culross Peattie's *Flowering Earth*, Huxley's *A Lobster*; or, *The Study of Zoology*, and Eve Curie's *The Discovery of Radium*. This is a text edition of the earlier and highly successful trade edition, but enlarged and with the section on atomic fission added. Pp. xii, 772. Harper & Brothers, 49 East 33rd St., New York 16, 1946. \$3.25.

A revised edition has just appeared of a classic in this field, by one of the greatest science historians, *A History of Biology*, by Charles Singer. In a terse style adapted to condensation, Dr. Singer, Professor Emeritus of the University of London and for many years lecturer at Oxford, gets the chief currents of the development of all branches of biology within the compass of a single volume. The three Parts are entitled: the older biology, the historical foundations of modern biology, and the emergence of main themes of contemporary biology. As an example of the plan of organization, the Chapters (IX to XV)

of Part III are: cell and organism, essentials of vital activity, relativity of functions, biogenesis and its implications, development of the individual, sex, and the mechanism of heredity. The illustrations are well chosen. Only a few are portraits; mostly they represent the original contributions of the biologists discussed, as Hooke's drawing of a flea, Belon's comparison of bird and human skeletons, or organisms discovered by the *Challenger* expedition. Biography is held to a minimum, most of the account of each notable being concerned with his work and its significance. The author taught biology from the historical approach and so this volume serves as an introduction to the subject matter itself as well as an exposition of how this matter was discovered and used, a purpose reflected in the subtitle: *A General Introduction to the Study of Living Things*. Pp. xxxv, 579; figs. 194 incl. frontisp. Henry Schuman, Inc., 20 E. 70th St., New York 21, 1950. \$5.00.

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